

Infrastructure, environment, buildings

Mr. Mike Ribordy U S. EPA Region 5 77 West Jackson Boulevard (SE-5J) Chicago, IL 60604 ARCADIS
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Chicago
Illinois 60603
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Fax 312 332 4434
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Subject

Subcontractor Qualifications

Plainwell Dam #2 - Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site

ENVIRONMENTAL

Dear Mr. Ribordy.

As outlined in Paragraph 10 of the 2009 Administrative Settlement Agreement and Order on Consent for Plainwell Dam #2 of the Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site, this letter presents the qualifications for the following subcontractors:

Date

August 24, 2009

 American Environmental Group, Ltd. (AEG) will be retained to perform liner installation. Contact

Steve Garbaciak

JF New will be retained to provide restoration and planting services.

Phone

312.332.4937 x12

Terra Contracting, LLC (Terra) will be retained to provide construction support (e.g, clearing, grubbing, earthwork).

mail

Steve Garbaciak@ arcadis-us.com

KAR Laboratories, Inc. (KAR) will be retained to provide laboratory analytical services.

Our ref

B0064536 #2

 TestAmerica, Inc. (TestAmerica) will be retained to provide laboratory analytical services.

Please contact me if you have any questions.

Sincerely,

ARCADIS

Stephen Garbaciak Jr., P.E.

Principal Engineer/Vice President

US EPA RECORDS CENTER REGION 5

Attachments

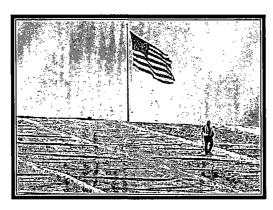
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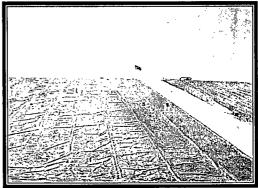
James Saric, United States Environmental Protection Agency (without attachments)
Leslie Kirby-Miles, United States Environmental Protection Agency (without attachments)
Richard Karl, United States Environmental Protection Agency (without attachments)
J. Michael Davis, Esq., Georgia-Pacific Corporation (without attachments)
Garry Griffith, Georgia-Pacific Corporation (without attachments)

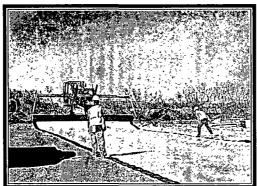


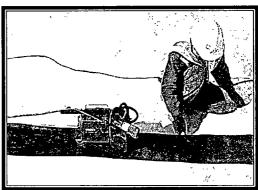
American Environmental Group, Ltd.

Company Overview









3600 Brecksville Road, Suite 100, Richfield, OH 44286, (330) 659 – 5930



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1.0 Introduction

American Environmental Group, Ltd (AEG) is an Ohio Limited Liability Company, founded in January of 2002 to provide specialty construction and construction management services to select solid waste, environmental, and industrial clients

AEG is a direct provider of environmental control systems. Because AEG self-performs most aspects of contracted projects we are able to provide a level of quality and consistency of service that exceeds our clients' expectations.

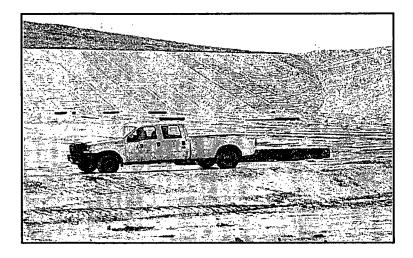
AEG's Specialties include

- Geosynthetics supply and installation
- Landfill gas extraction well drilling and installation
- Landfill gas/leachate collection system construction
- Operations and maintenance open and closed sites
- Construction management

Our nationwide client base includes both private and public landfill owner/operators, consulting/engineering firms, general and specialty contractors, alternate energy and landfill gas developers, and other environmental and industrial firms

AEG's five-member ownership team collectively possesses over 100 years of experience in the environmental construction industry. Combined with key employees who add depth of knowledge and training, AEG considers our human resources to be our greatest strength.

Due to a "client centered" focus, AEG welcomes teaming relationships in the form of service partnerships and strategic alliances with consulting, engineering, and contracting firms. As a result, clients receive the extra value and efficiency of a seamless team effort.





2.0 Safety

AEG believes that safety is paramount to the success of the company. Our safety efforts can be summarized as indicated in our Mission Statement, "We will consistently perform our work with an unwavering focus on safety." Further, our safety goal is also very brief 'Zero Accidents."

Based on the company's growth and an increase in the number of OSHA recordable accidents experienced in 2006, AEG rededicated and expanded our safety program in 2007 to include the following

- Commit an owner of the company exclusively to full time "Safety Director" position
- Documented daily "Tailgate Safety Meetings" all crews all divisions Safety meetings are given by the senior supervisor, manager or an owner on site that day
- Expand new employee orientation training to include a professional in house safety video emphasizing on the employee safety concerns and historical areas of concern. The video was staged on multiple AEG projects and performed in a large part by employees.
- Refocus on Health and Safety Plans by requiring all employees to review and execute a documented written test
- Perform random Project Safety Audits performed by Safety Director in excess of 40 per year
- Continue to emphasize the company's Drug Free Program with Zero Tolerance
- Train employees as in-house trainers for Drug Free, New Employee
 Orientation and Fork lift and Aerial lift certifications
- Triple the company's spending budget in regards to all aspects of training
- Perform weekly safety update discussions between the owners of the company
- Monthly safety awards presented to employees from each division
- Active owner participation at annual trainings
- Safety is the first topic of discussion at all management meetings
- Bi monthly mailing of safety briefs to all supervisors.
- A safety briefing is prepared and sent to all management and field supervisors in the event of any accident, injury, near miss or any industry incident. Safety briefings are required to be reviewed at the next daily tailgate meeting.

These results have achieved spectacular results in 2007 and the first part of 2008

- A 74% drop in OSHA recordable injuries from 2006 levels was realized in 2007
- Year to date in 2008 showed a continued drop of 50% of OSHA recordable accidents from 2007 levels
- One OSHA recordable to date in 2008
- The Geosynthetic division has not had an OSHA recordable for over 2 years (June 6, 2006 was the last recordable accident)
- AEG's last Lost Time Injury was on July 6, 2007



AEG Safety Statistics

EMR for the last four years:	2005 2006 2007 2008	0 71 0.63 0 63 0 66
OSHA injury/illness incident Rates (IR):	2005 2006 2007 2008	4 19 7.36 1 63 2.88
OSHA lost time incident rate (LTIR):	2005 2006 2007 2008	0.52 0 86 0.81 0 36



3.0 Past Performance

AEG strives to provide the industry with competitive specialty services with unparalleled Integrity, Professionalism, and Performance Our Client Centered focus fuels our determination to provide a consistently superior service and quality products

AEG has proved itself as a leader in the geosynthetic installation industry through their continuous quality of work and ability to overcome challenges. Our major accomplishments include, but are not limited to, such projects as

Ashtabula River Cleanup – At the request of the General Contractor who was facing severe scheduling issues which could result in substantial liquidated damages and other claims, AEG mobilized the necessary resources to install of over 3,658,500 sf of geosynthetic materials in only 30 calendar days. AEG faced challenges such as a historical rain event (over 7 inches) and achieved the stringent schedule despite 7 non-work days due rain, extreme heat, high winds, and working at night

Allied Waste National Contract – Awarded a national contract to service one of the largest solid waste companies in the United States—AEG was exclusively awarded the contracts to over 40 sites in Allied Waste's Northeast and Midwestern regions—AEG's is responsible for the management of the geosynthetic materials which include ordering of materials, scheduling delivery of materials to site, and overseeing quality control and conformance testing, as well as the installation of the material—AEG documents all field work in an effort to ensure proper installation of materials through quality assurance and control procedures

Republic Services National Contract – AEG is consistently awarded contracts to service another large company in the solid waste industry throughout the northeast region. AEG provides the same services to Republic Services as with Allied Waste, and continues this quality of service to all our clients.



Geosynthetic References

•	Todd Hamilton, (Republic Services, OH)	330-874-3855
•	Steve Wintheiser (CTI & Associates, OH, IL, IN, PA MI)	248-486-5100
•	Kevin Harshberger (R B Jergens, OH)	937-760-7676
•	Christina Pearse-Bossick (Allied Waste Industries, MI)	734-397-2790
•	Brian Ezyk, P E (Republic Services, MI)	734-654-1158
•	Steven Melloni, P E (Brown and Caldwell, MA)	508-923-0879
•	Elena Goodhall, P E (Allied Waste Industries, US)	419-396-3581



4.0 Manpower & Equipment

The most important asset at AEG is the people who perform the work and those who support that performance AEG's personnel plan reflects the seasonal nature of the construction related service offerings of the firm AEG has been able to meet peaks in labor demand with full-time employees, thereby maintaining continuity and professionalism, and minimizing recruiting and training expenses Resumes for a number of these key employees are included in Appendix B

The quality exhibited in AEG's project performance is a testimony to the importance placed on the employment and training of our staff

- Employment AEG has enjoyed rapid growth in employment since its inception in January 2002, and the work force now exceeds 280 people. To help ensure consistency and dependability in our employees, we place great emphasis on the following pre-qualification routine:
 - Pre-employment screening, including pre-employment physicals, drug screening, background research, and multiple interviews AEG is a certified Drug-Free Workplace Company
 - I-9 background checks and Social Security member verification
 - Medical monitoring, including random drug testing
 - Equal Opportunity employment
 - Competitive wages and benefits including disability insurance, 401K, profit sharing, paid vacations, complete medical insurance
 - Mandatory review of employee policies and procedures
 - · Annual performance reviews
 - On-going and continuous safety and professional training
 - Career path definition
- Training AEG provides extensive training to its field personnel, with a heavy orientation towards OSHA Health and Safety Training. Depending on their project responsibilities, most AEG employees have received certification in OSHA 40 hour and 8 hour refresher courses for Hazardous Waste Operations and Emergency Response (HAZWOPER) training. Additionally, supervisory and technical personnel attend additional OSHA training annually, including
 - Supervisor's Training
 - Competent Person Trench Safety Training & Confined Space Entry Training

Supervisory personnel also receive additional training at industry seminars, many of which are sponsored by the Solid Waste Association of North America (SWANA) AEG actively supports SWANA by participating in these sessions as well as national and regional landfill and landfill gas symposiums

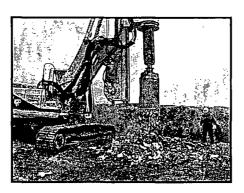
Additionally, a number of AEG employees receive annual testing and certification in specific project skills, including

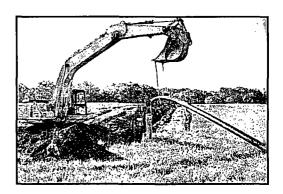
- HDPE pipe fusion
- Geosynthetics installation, including testing procedures and equipment



- IAGI Certified Welding Technician Training
- American Red Cross First Aid and CPR Training
- Specialized LFG training, including equipment operations and maintenance (Daniels Gas Chromatographs, LFG flares, pumps and pumping systems)

Although each of AEG's business disciplines have different manning requirements, much of the general training, i.e., equipment operations, HDPE pipe fusing, health and safety training, etc., is common. This permits crew personnel to be shared among the disciplines when needed and helps to ensure that projects are staffed with qualified and experienced personnel.



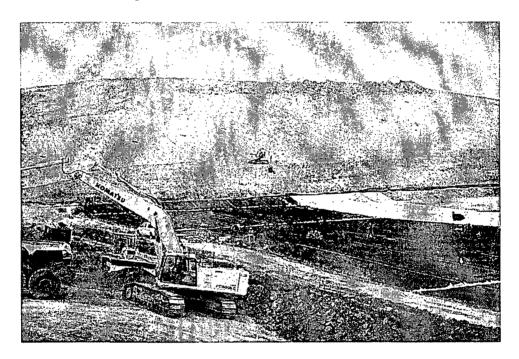




5.0 Production and Schedule

AEG's crews are capable of installing 100,000 SF and 180,000 SF per day of geosynthetic materials (under good weather working conditions). Production rates for installation of materials on the side slopes will range between 50,000 SF and 85,000 SF. Our crews will work with the general contractor in conjunction with the production rates of the subgrade soil preparations and cover soil placement.

Proper scheduling and communication between all parties will ensure that an adequate amount of approved subgrade is lined each day. More important is that an excessive amount of uncovered geomembrane is not left vulnerable to site wind conditions.





6.0 Key Personnel

AEG has a proven commitment to providing the highest quality geosynthetic installation service in the industry. Our field personnel have over 800 years of combined experience in installing hundreds of millions of square feet of geosynthetic products in a wide variety of applications.

To insure quality, AEG self performs the vast majority of its work Further all personnel undergo continuous training throughout their employment with AEG Some of the training includes

- New Hire Safety
- OSHA 40 Hour
- First Aid / CPR
- Drug Free
- IAGI Certified Welding
- · Various equipment training included Forklift and Aerial-Lift



Resumes of Key Employees



Carl J. Apicella

Professional Qualifications

Carl Apicella is a founding Member and serves as President of AEG. He has over 18 years of experience in the solid waste and environmental industry, and proven expertise in the operations and general management of solid waste landfills. Mr. Apicella's work experiences include General Manager of the Western New Territories Landfill (Hong Kong) for Swire BFI Waste Services Limited, where he was responsible for the overall management of one of the largest modern solid waste facilities in Asia. His responsibilities included landfill design, construction management, disposal operations, landfill gas and electrical generation, and environmental protection of the facility. Mr. Apicella holds a BS degree in Chemical Engineering, and is on the Board of Directors for the International Association of Geosynthetic Installers (IAGI)

Experience and Employment Background

1/02 – Present American Environmental Group, Ltd , Richfield, Ohio

President (2006-present), Secretary (2002-2006), and Member

1/01 – 1/02 IT Corporation, Brecksville, Ohio

Operations Manager, Midwest Region – Mr Apicella had P&L responsibility for the civil construction and construction management operations in the Midwest region. He was also responsible for the development and operations of the Company's internal geosynthetic's fabrication and installation operation provided on a national basis.

1994-12/00

WENT Landfill, Swire BFI Waste Services Limited, Hong Kong General Manager - Mr Apicella held overall responsibility for all aspects of the modern, 100 million cubic yard capacity WENT Landfill under a design, build, and operate contract awarded by the Hong Kong Government His management responsibilities included overall fiscal responsibility of the facility with annual revenues range between US \$25-70 million, management, training and development of over 125 employees, review and budgeting of all engineering/design, construction and operational activities; negotiations with the Environmental Protection Department of Hong Kong Government and the Independent Consultant, negotiations and budgeting associated with the purchasing of capital equipment, spare parts, materials, and other service contracts, as well as short and long-term fiscal and operational planning critical to the long term success of the 30 year project He supervised the operations of the waste water treatment plant, a 400 ton per day grease trap waste treatment system, a 3 6



Resume of Qualifications Carl Apicella Page 2

MW landfill gas and electrical generation system and a certified environmental laboratory

1992 - 1994 Warner Hill Landfill, Warner Hill Development Company, Garfield Heights, Ohio

Vice President – Mr Apicella was responsible for overall site management of this closed facility. He managed the construction oversight of various capital improvement projects including installation of an extensive landfill gas extraction system, geotechnical investigations, and site remedial activities

Glenwillow Landfill, Browning Ferris Industries, Glenwillow, Ohio

Landfill Manager - Mr Apicella led a successful team in permitting a vertical expansion at the closed Glenwillow Landfill He then oversaw the start-up operations of the facility Mr Apicella's responsibilities included overall P/L management and budgeting, planning and executing the reception and disposal of waste, construction management, engineering, permitting, and environmental compliance

Willowcreek Landfill, Browning Ferris Industries, Atwater, Ohio **Project Manager** - Mr Apicella was responsible for management and oversight of an extensive site investigation and capital improvement project ('93-'94)

1990 – 1991 Fansteel Metals, Muskogee, Oklahoma

Technical Advisor, Environmental Engineering - Mr Apicella's responsibilities included oversight of environmental remediation project including hazardous and radioactive wastes as well as assisting in a technology transfer agreement between his employer and a Company located in Thailand

1989 – 1990 Earth Sciences Consultants Incorporated, Export, Pennsylvania

Environmental Engineer - Mr Apicella provided consulting services associated with landfill design and permitting, NPDES monitoring, process engineering and other environmental related work

Academic / Training Background

President, Board of Directors, International Association of Geosynthetic Installers (IAGI), 2004 – Present Solid Waste Association of North America (SWANA) B S, Chemical Engineering, Ohio University (Cum Laude), 1989

Pennsylvania EIT, 1989 OSHA 40 Hour Training Course – CFR 1910 120 OSHA 8 Hour Refresher Training – CFR 1910 120 OSHA 8 Hour Supervisor's Training – CFR 1910 120

MSHA 8 Hour Training



Peter J. Augustin

Professional Qualifications

Peter Augustin is one of the founding Members and serves as Treasurer/Vice President of AEG. Mr. Augustin has over 15 years of experience in the solid waste and environmental industry, and prior to that he was involved in heavy civil, specialty foundation and underground utility construction. Mr. Augustin has held positions of increasing responsibility from field engineer on an underground utility crew to serving as the General Manager for a national construction division producing in excess of \$25 million of annual revenues. Mr. Augustin has been responsible for the development and management of several complex solid waste construction projects including a \$12 million consent order driven landfill closure/groundwater remediation and the \$15 million design/build of a greenfield landfill site in eastern Pennsylvania

Experience and Employment Background

<u>01/02 – Present</u> American Environmental Group, Ltd , Richfield, Ohio **Treasurer, Vice President, and Member**

EMCON/OWT, a member of the IT Group, Brecksville, Ohio

General Manager - Solid Waste Service Construction Division

Mr Augustin had complete P&L responsibility for a \$25 million/year solid waste construction services operation. He completed the integration of this operation with a new parent company, developed new construction service operations in California and Texas, and

geosynthetics fabrication and installation operation

1995 – 1999 Organic Waste Technologies, Inc , Middleburg Heights, Ohio General Manager - Environmental Construction Services

Mr Augustin had P&L responsibility for solid waste construction, including landfill gas system construction and drilling, construction management services, and civil construction operations. He established management control systems to sustain/promote a controlled 45% growth rate in the construction division. He also negotiated and managed the \$15 million greenfield design/build of the Commonwealth Landfill in eastern Pennsylvania. Mr Augustin also developed and managed a multi-million dollar construction management program for various landfill sites throughout the Midwest

promoted the substantial growth and profitability of the firm's



Resume of Qualifications Peter Augustin Page 2

> Region of Republic Waste Services, and he developed the company's self-perform capabilities in the field of geosynthetics installation

Wehran Construction, Inc , Middletown, New York 1991 - 1994

Senior Project Manager/Estimator - Environmental Construction

Services

Mr Augustin served as the chief estimator for turnkey environmental construction projects He negotiated prime and subcontract agreements and maintained project accounting and cost tracking records Mr Augustin also assisted with the design of solid waste landfills, transfer stations, and groundwater remediation systems

ICOS Corporation of America, Englewood, New Jersey <u> 1988 – 1991</u>

Project Manager - Mr Augustin was responsible for preparing estimates and coordinating field activities for utility and slurry wall construction projects. He assisted with the design of structural foundation systems utilizing slurry trench construction. Mr. Augustin also served as project manager for numerous structural foundation and hydraulic barrier (slurry trench) construction projects, several in

excess of \$5 million

1986 - 1988 SEU Construction, Cape Coral, Florida

Project Engineer - Responsible for coordinating project start ups, contract administration and site layout. He prepared and updated construction schedules utilizing CPM Network Analysis Mr. Augustin also assisted with the procurement, cost accounting, and solicitation

of subcontract proposals

HYCON Construction Corp , New York, NY <u> 1984 – 1986</u>

> Field Engineer, Sanitary Sewer Rehabilitation - Responsible for performing site surveys, assisted superintendent with crew scheduling and materials procurement. Mr Augustin also prepared technical

submittals and project cost reports

Academic / Training Background

B S, Civil Engineer, University of South Florida, Tampa, FL Member of Chi Epsilon National Honor Society USF Civil Engineering Honor Society EIT Exam - 1984



James Helmick

Professional Qualifications

Jim Helmick is one of the founding Members and serves as Corporate Health and Safety Director, and Vice President of AEG. Mr. Helmick has over 32 years of experience in the drilling industry, and he is experienced in landfill gas and leachate well drilling and installation as well as oil and natural gas well drilling. Mr. Helmick's previous responsibilities included his role as General Manager of the Environmental Drilling Division of Organic Waste Technologies, where he was responsible for the overall performance of the Environmental Drilling Division, including LFG well installation, leachate extraction, and LFG well restoration. Additional responsibilities included business development, cost estimating, and project management of up to 100+ landfill well installation projects per year. Mr. Helmick has completed in excess of 1,200 landfill gas projects through out the United States, Canada, and Hong Kong, and has significant expertise in developing new technology used in the drilling industry including, bucket design and servicing existing LFG and leachate wells

Experience and Employment Background

1978 – 1987

<u> 1/02 – Present</u>	American Environmental Group, Ltd , Richfield, Ohio
-	Corporate Health & Safety Director (2007), Vice President

Organic Waste Technologies, and the IT Group, Brecksville, OH General Manager, Environmental Drilling Division - responsible for business development, cost estimating, and coordination of field operations and overall P&L of the Environmental Drilling Division Mr Helmick was responsible for the design of proprietary drilling equipment and methodologies used to clean and rejuvenate the production of existing landfill gas and leachate extraction wells

IDECO, a Division of Dresser Industries, Beaumont, Texas

Senior Sales and Service Representative - Mr Helmick was
responsible for the Eastern regional sales of capital equipment
including complete rig packages up to \$5 million and components up
to \$25,000 Mr Helmick also supervised the initial field assembly of
all drill rig packages



Resume of Qualifications James Helmick Page 2

Academic / Training Background

Competent Person Training
Hydrogen Sulfide Training - 8 Hours
Sanitary Landfill Design - 16 Hours
OSHA 40 Hour Training Course – CFR 1910 120
OSHA 8 Hour Refresher Training – CFR 1910 120
OSHA 8 Hour Supervisor's and Competent Person Training – CFR 1910 120
Improving Managerial Skills of New Prospective Managers (AMA) 24 Hours
Effective Speaking and Human Relations - (Dale Carnegie) 40 Hours
Fundamentals of Finance and Accounting for New Financial Executives (AMA)



Michael C. Maurer

Professional Qualifications

1988 - 1/02

Mike Maurer is one of the founding Members and serves as Secretary/Vice President of AEG. Mr. Maurer has over 18 years of experience in the environmental construction industry in both landfill gas and leachate system installation as well as oil and natural gas well drilling. Mr. Maurer's responsibilities have included Field Operations Manager of the Landfill Gas Systems (LFG) Installation Division of Organic Waste Technologies. As Operations Manager, he was responsible for the overall performance of the LFG Systems Installation Division, including LFG pipeline installation, leachate extraction systems, and LFG flare installations. Additional responsibilities included business development, cost estimating, and project management.

Experience and Employment Background

<u>1/02 – Present</u> American Environmental Group, Ltd., Richfield, Ohio Secretary (2006-present), Vice President, and Member

Organic Waste Technologies, Inc (EMCON/OWT), Brecksville, Ohio Field Operations Manager - Landfill Gas System Installation, Responsible for overall landfill gas and leachate collection system installation. Responsibilities included managing five pipeline crews throughout the United States. Mr. Maurer was also responsible for performing constructability reviews, preparing proposals, project cost tracking, invoicing, client relations, business development, scheduling and annual budget development. Mr. Maurer also assisted with the procurement and maintenance programs for the division's heavy equipment program.

1986 – 1988 RC Maurer Excavating, North Canton, Ohio

General Superintendent - Mr Maurer was responsible for the daily operations in the field and for set up and operation of inline laser equipment for pipe installation Mr Maurer also prepared sites for sanitary and storm sewer installation and land reclamation



Resume of Qualifications Michael C. Maurer Page 2

1979 – 1986

Various oil field related employment, Stark County, Ohio Field Operations Manager — Supervised oil and natural gas well drilling and completion, and coordinated and supervised all work performed by subcontractors Mr Maurer was responsible for logging and perforating of gas wells and all piping, well heads, separators, and tank battery hook ups He designed and performed fracturing techniques with Halliburton Services, Inc, and he was responsible for designing and installing salt water disposal wells, as well as for SPCC reports to the State of Ohio Mr Maurer supervised three service rig completion crews, four drilling crews, and five pipeline crews

Academic / Training Background

Utah State University
North Carolina State University
General Courses – Completed 2 Years
Sanitary Landfill Design – 16 Hours
Hydrogen Sulfide Safety Training – 8 Hours
OSHA 40 Hour Training Course – CFR 1910 120
OSHA 8 Hour Refresher Training – CFR 1910 120
OSHA 8 Hour Supervisor's and Competent Person Training – CFR 1910 120
Halliburton Cement and Fracturing School
Dowell Chemical Logging Classes



Ernest L. Vallorz, Jr.

Professional Qualifications

Ernie Vallorz is the Chief Financial Officer of AEG. Ernie most recently was the Relationship Team Manager for the Cleveland Ohio District Commercial Banking Group of KeyBank N A. Prior to being the Relationship Team Manager he was a Managing Director with KeyCorp's McDonald Investments, Key Business Advisor Services, an Investment Banking Group handling merger and acquisition opportunities for closely held companies. Prior to his ten years with KeyCorp, Mr Vallorz worked for twelve years with Arthur Andersen & Co. as a Senior Tax Manager working primarily in the closely held business arena. While employed at Arthur Andersen, Mr Vallorz served on the National Family Wealth Transfer Advisory group. Mr Vallorz is a CPA and JD and has a Bachelor of Arts Degree in Accounting and Political Science from Augustana College and a Juris Doctorate from the University of Notre Dame Law School

As CFO of AEG, Mr Vallorz is responsible for all accounting, financial and administrative functions of the company

Experience and Employment Background

10/06 - Present American Environmental Group, Ltd - Richfield, Ohio

Chief Financial Officer

07/96 - 09/06 KeyCorp, Inc - Cleveland, OH

Relationship Team Manger – KeyBank, N.A. (01/02 - 09/06)

Managing Director – McDonald Investments (01/98 – 12/01)

Vice President – KeyBank, N.A. (07/96 – 12/97)

06/84 - 07/96 Arthur Andersen & Co - Cleveland, OH

Senior Tax Manager (07/94 – 07/96) **Tax Manager** (07/89 – 06/94)

Tax Senior (07/86 -06/89) Tax Staff (06/84 - 06/86)



Resume Of Qualifications Ernest L. Vallorz, Jr. Page 2

Academic / Training Background

Juris Doctorate - University of Notre Dame Law School, Notre Dame Indiana, May 1984

Bachelor of Arts (Cum Laude), Accounting and Political Science, Augustana College, Rock Island, IL, November 2000

Certified Public Accountant, State of Illinois (1982) and State of Ohio (1986)

Licensed Attorney (Ohio) November 1984



John Beeman

Professional Qualifications

John Beeman possesses over 19 years experience in the geosynthetics industry He has supervised and installed over hundreds of millions of square feet of numerous types of geosynthetic material from all major manufacturers. He has performed and supervised projects ranging up to 10,000,000 square feet and has been named as an authorized/certified representative for several liner manufacturers. He has extensive experience in the installation of high and low density polyethylene, polyvinyl chloride. polypropylene, XR5, geotextiles, geocomposite and other related products. Mr. Beeman also managed a large scale fabrication facility producing over 10,000,000 square feet annually

Mr Beeman's technical experience includes research and development of state-of-the-art fusion and extrusion machines and welding techniques while working with a major equipment manufacturer

Experience and Employment Background

03/02 - Present American Environmental Group, Ltd., Richfield, Ohio **Operations Manager - Geosynthetics**

1997 - 02/02 EMCON/OWT, a member of the IT Group, Brecksville, Ohio **Operations Manager (Liner Division)**

> Mr Beeman played a key role in the substantial growth of the firm's geosynthetics fabrication and installation. He was responsible for hiring, scheduling, and supervising all employees in the geosynthetic installation division He managed all estimating, procurement, and provided technical support and estimating services to other Mr Beeman was also departments within the corporation instrumental in the starting up and development of a fabrication facility

<u> 1995 – 1997</u> Mid American Lining Company, Union City, TN **Construction Manager**

Mr Beeman was responsible for marketing, estimating and project management of a facility performing over \$15,000,000 annually Mr Beeman procured numerous types of geosynthetic materials for field operations covering over 20 states and internationally, and he managed all aspects of a fabrication facility producing over

10,000,000 square feet of geosynthetics annually



Resume of Qualifications John Beeman Page 2

<u> 1989 – 1995</u>

National Seal Company, Cranberry Township, PA

Positions of increasing responsibility to Construction Supt.

Mr Beeman was responsible for marketing, estimating, and project management for liner installation crews He supervised and managed installations on projects ranging up to 10,000,000 square feet with a crew of over 20 people He was part of a research and development effort to modify and improve methods and techniques for liner

seaming and welding

Academic / Training Background

Pueblo Vocational Community College Welding Technology 1989

NICET Certified (Level II Technician)

OSHA 40 Hour Training Course - CFR 1910 120

OSHA 8 hour Refresher Training - CFR 1910 120

OSHA 8 hour Competent Person Certificate, including Trench Safety Training

IAGI Certified Welding Technician



Tom Sparks

Professional Qualifications

Tom Sparks possesses over 16 years experience in the geosynthetics industry. He has managed project installations totaling hundreds of millions of square feet of geosynthetic materials for a major manufacturer and installer. He has extensive experience in the installation of high and low density polyethylene, geotextiles, geocomposites and other related products.

Mr Sparks developed the submittal / technical process at Serrot International

Experience and Employment Background

2003 - Present

American Environmental Group, Ltd , Richfield, Ohio Project Manager - Geosynthetics

<u>1994 – 2002</u>

Serrot International Inc , Cranberry Twp , Pennsylvania Project Manager / Technical Manager

As a Project Manager, Mr Sparks was responsible for all aspects of construction on installation projects in his Midwest Region Mr Sparks managed between 2 and 6 geosynthetic crews on a continual basis. His duties included P&L management, materials management, crew scheduling, daily coordination with clients, invoicing of contract and extra work items. Mr Sparks was responsible for overall client satisfaction.

Mr Sparks led the transition to combine Serrot Corporation and National Seal Company Submittals / Technical procedures Tasks included generating or revising material specifications, product manufacturing and installation guidelines, training technical personnel in other regional locations, and development of company wide submittal / technical standards and work flow processes

As Technical Manager, Mr Sparks was responsible for negotiating specifications with Clients, Engineers, or Representatives. He coordinated with internal and external laboratories for specific material testing requirements. He worked with the shipping department to ensure that materials shipped were in compliance with site specific requirements and coordinated the materials certification process with internal manufacturing and external vendors.



Resume of Qualifications Tom Sparks Page 2

<u> 1992 – 1994</u>

Golder Associates, Atlanta, Georgia Senior Engineering Technician

Mr Sparks was the on site manager overseeing the documentation of all relevant aspects of landfill construction. He reviewed material certifications to ensure compliance with project specifications. He coordinated daily with the owner, earthwork contractor, and installation contractor. He facilitated problem / resolution meetings as necessary. Mr Sparks performed on-site testing of materials. He prepared documentation for inclusion into final reports for submittal to state regulatory agencies for approval.

Academic / Training Background

BBA - Georgia State University, 1992

IAGI Certified Welding Technician



Michael Moneymaker

Professional Qualifications

Michael Moneymaker possesses over 15 years experience in the environmental industry. He has supervised and installed over tens of millions of square feet of numerous types of geosynthetic material from all major manufacturers. He has performed and supervised projects ranging up to 10,000,000 square feet. He has experience in the installation of high and low density polyethylene, polyvinyl chloride, polypropylene, XR5, geotextiles, geocomposite and other related products.

Mr Moneymaker's technical experience includes site investigations and environmental audits, soil, water, and air sampling, regulatory compliance and reporting, field and office training, and machine operation and repair

Experience and Employment Background

2006 – Present American Environmental Group, Ltd , Richfield, Ohio Estimating Manager – Geosynthetics Division

2002 – 2006 Delphi – Packard Division, Warren, Ohio Up-Front Environmental Engineer – Global Manager

In his position at Delphi, Mr Moneymaker was the global environmental manager for over 130 facilities world-wide. He was responsible for the management of projects, processes, and personnel relating to all issues involving environmental compliance. He was also a team member in the effort to assure complete client satisfaction of service and quality of supply

While in this position, Mr Moneymaker developed cost saving techniques for the handling and disposal of waste products, as well as communization of procedures for processes on a global basis

2000 – 2002 Arcadis Geraghty & Miller, Inc., Fullerton, California

In his position at ARCADIS, Mr Moneymaker's was directly involved in over 400 site-remediation projects, from field work to project management roles. His scope of work ranged from hands-on field investigations (monitoring and sampling), to project management (over-site of daily activities). Field activities were related to the tracking of the migration of soil and groundwater contamination plumes over extended periods of time. Project management activities related to the documenting and reporting of the site activities to the corresponding city, state, and federal government agencies.

1999 – 2000 Environmental Resources Management (ERM), Irvine, California Task Manager - Environmental Engineer

In his position at ERM, Mr Moneymaker's was directly involved in over 100 site-remediation projects, from field work to task management roles. His scope of work ranged from hands-on field investigations.



Resume of Qualifications Michael Moneymaker Page 2

(monitoring and sampling), to task management (over-site of daily activities) Field activities were related to the tracking of the migration of soil and groundwater contamination plumes over extended periods of time. Task management activities related to the documenting site activities for the purpose of reporting to city, state, and federal government agencies.

1996 - 1999

Delphi Automotive Systems & General Motors, Dayton, Ohio Environmental Engineer

In his position at Delphi, Mr Moneymaker's responsibilities involved the tracking and reporting of hazardous wastes used in the manufacturing facilities. His other responsibilities included being a team member of an Emergency Spill Response Team, training employees on Health & Safety procedures, and developing data-bases to more efficiently track and report material usage

ACADEMIC TRAINING/ BACKGROUND

University of Dayton - Civil and Environmental Engineering degree

OSHA HAZWOPER 40 Hour (OSHA 29CFR1926 65) Certified

OSHA HAZWOPER 8 Hour Refresher (OSHA 29CFR1926 65) Certified

OSHA 8 Hour Supervisor's and Competent Person Training (CFR 1910 120)

Construction Supervisor (OSHA 29CFR1926 Construction Industry Regulations) Certified

Arial Lifts & Forklift Train-the-Trainer Training

IAGI Certified Welding Technician (CWT)

First Aid / CPR / AED (Automated External Defibrillator) Certified

Drug Free Workplace Training & Drug Free Workplace Train-the-Trainer Training

Excavation Safety Competent Person (OSHA 29CFR1926 Subpart B)

Construction QA/QC for Geosynthetic Installers Certified

Department Of Transportation (DOT) - Hazardous Materials Transportation trained

ISO 14001 Certified (Understanding ISO 14001 training (16 Hour))

Change Management II Systems - CMII systems training (8 Hour)

Roadway Worker Certified - Railroad On-Track Safety training (8 Hour)

RCRA Hazardous Waste Management training (8 Hour and refreshers)

Annual Health and Safety training courses (Delphi specific training programs)



Christopher A. Eichelberger

Professional Qualifications

Chris Eichelberger possesses over 8 years experience in the solid waste / geosynthetics industry. He has managed CQA / Engineering processes for the construction of landfill expansion, closure, and gas extraction systems. Chris has served as project manager, estimator, and technical manager for various landfill construction projects, floating covers, aquaculture/agriculture applications, lined containment areas and additional geosynthetic material applications in excess of hundreds of million square feet of installation. He has worked in developing a greater market presence for non-traditional geosynthetic applications and construction. He possesses extensive product and technical knowledge of all geosynthetic materials and their respective appropriate applications.

Experience and Employment Background

11/07 - Present

American Environmental Group, Ltd , Richfield, Ohio

Project Manager

<u>03/05 – 11/07</u>

Comanco Environmental Corporation, Plant City, Florida Estimator/Technical Manager

In his position at Comanco, general responsibilities included the estimating, negotiating, and management of technical issues associated with millions of square feet of installed geosynthetic materials annually. The management of technical issues included the clarification of inconsistencies within specifications, structuring of submittal format, written correspondence addressing problems associated with projects, successful contract administration of public and private work, handling responsibilities of pre-bid, pre-construction, progress and specific issue meetings associated with a project, and ensuring ultimate client satisfaction with finished product. Chris was also responsible for maintaining knowledge of all current industry standards regarding material supply, testing, and installation and providing training for geosynthetics estimating to other staff members. An additional role played by Mr. Eichelberger included a technical sales position to establish a greater market presence within non-traditional geosynthetic material applications.

04/00 - 03/05

Cumberland Geotechnical Consultants, Inc , Carlisle, PA GeoEnvironmental Scientist

Chris served as Project Manager for construction quality assurance associated with the construction, closure, and expansion phases of solid waste landfill facilities for various national account customers Typical projects included coordination of soils, geosynthetics, leachate



Resume of Qualifications Chris Eichelberger Page 2

collection, and landfill gas collection system scopes of work Additionally, he prepared specifications and bid packages, as well as preparation and submittal of final certification and permit modification documents for landfill sites in various states

Chris also served as the Risk Management Coordinator for the firm. In this role he collected, evaluated, and distributed literature relating to risk management for the engineering community and developed inhouse training programs used as educational tools.

Academic / Training Background

The Pennsylvania State University - Bachelors of Science Degree

Active Member International Association of Geosynthetic Installers (IAGI), Voting

Member ASTM Committee D-35

Completion and Participation of numerous industry seminars and workshops - 8 hour



Michael Bair

Professional Qualifications

Mike Bair possesses over 19 years experience in the geosynthetics industry. He has performed as a Vice President developing the sales and marketing firm for the company financials He Managed, Supervised, installed, and fabricated, over millions of square feet of numerous types of geosynthetic material for major manufactures and installers He has performed as a Vice President developing supervised projects ranging up to 10,000,000 square feet He has extensive experience in the installation of high and low density polyethylene, polyvinyl chloride, polypropylene, XR5, geotextiles, geocomposite and other related products

Experience and Employment Background

American Environmental Group, Ltd, Richfield, Ohio 2008 - Present

Project Manager

Landsaver Environmental, Inc , Richmond, VA 2005 - 2008

Manager - Containment Division

Mr Bair played a key role in the substantial growth of the firm's geosynthetic installation. He was responsible for, training and supervising his employees, developing new markets for the fabrication facility. He even became an Estimator bidding all projects

for the geosynthetics division

2004 - 2005In- Line Plastics, LC Houston, TX

Sales & Marketing - Geosynthetics

Mr Bair responsibility was Sales and Marketing as well as maintaining the geosynthetic materials and equipment for field operations covering over 25 states and he supervised all aspects of the installation process over 10,000,000 square feet of geosynthetics

1993 - 2003Colorado Lining International Parker, CO

Vice President - Company

Mr Bair was responsible for all operations of the company From QA/QC, Field Supervisors, Project Management, Chief Estimator, to business planning, budgeting, accounting, purchasing, and even Human Resources He trained employees all aspects of the geosynthetics fabrications and construction for major projects ranging from 10,000,000 square feet. He has extensive experience in the

instillation of Geosynthetics



Resume of Qualifications Mike Bair Page 2

Academic / Training Background

DeVry Institute of Technology - Phoenix, AZ

IAGA Certified Welding Technician

OSHA 40 Hour Training Course - CFR 1910 120

OSHA 8 hour Refresher Training - CFR 1910 120

Hertz Heavy Equipment Training

CPR/First Aid Training

Electronics

Auto Cad 12 13 14, 2000 & 2007



Eddie (Shorty) Keodouangsy

Professional Qualifications

Eddie Keodouangsy possesses over 20 years experience in landfill geosynthetic industry During that period he has performed and supervised numerous geosynthetic installation projects totaling hundreds of millions of square feet. He has experience supervising the installation of HDPE, LLDPE, XR5, Geosynthetic Clay Liners, Geocomposite, Geonets, Geotextiles, Polypropylene and PVC liners. Mr. Keodouangsy's experience includes international work in Hong Kong.

Experience and Employment Background

<u> 2003 – Present</u> *P*

American Environmental Group, Ltd, Richfield, Ohio

Geosynthetic Supervisor.

Mr Keodouangsy supervised geosynthetic crews with up to 30 technicians. He was responsible for fabrication and installation of various liner systems including. HDPE, LLPE, Polypropylene, XR-5, PVC and Geosynthetic Clay Liners. Capable of operating PWT Mouse, Sierra Dynamics Extrusion Welders, Demtech Welders, and Leister machines.

<u>1996 – 2003</u>

National Seal Company, Cranberry - Serrot Intl , Township, PA

Senior Geosynthetic Foreman

Mr Keodouangsy was responsible for running geosynthetic crews with up to 16 technicians. He was responsible for fabrication and installation of various liner systems including. HDPE, LLPE, Polypropylene, PVC and Geosynthetic Clay Liners. Capable of operating National Seal Smart Mouse, Columbine Extrusion and Fusion Welder and Leister welders.

1987 – 1996

Gundle Lining Systems, Houston, TX

Geosynthetic Foreman

Mr Keodouangsy was responsible for running geosynthetic crews with up to 16 technicians and worked on various types of installations including HDPE, LLPE, and PVC Capable of operating Gundle Hotwedge, X-10 Leister, Gundle Extrusion Welder.



Resume of Qualifications Eddie Keodouangsy Page 2

Academic / Training Background

- 40 Hour Hazwoper
- 8 Hr Hazwoper refresher (annually)
- 8 Hr OSHA Safety Training
- BP Refinery Training site specific IAGI Certified Welding Technician

Additional Equipment Operated:

- Front-end Loader
- Backhoe/Loader combination
- Bobcat Loaders various sizes
- Posi-tracks
- JCB Backhoe/Loader combination various sizes
- Forklifts rubber tired various sizes
- Excavators various sizes
- Small Bulldozers



Trevor Simmons

Professional Qualifications

Trevor Simmons possesses over 17 years experience in the geosynthetic industry. He has supervised and installed over 150,000,000 square feet of numerous types of geosynthetic material from all major manufacturers. He has performed and supervised projects ranging up to 7,000,000 square feet. He has experience installing and supervising the installation of HDPE, LLDPE, XR5, Geocomposite Clay, Geocomposite, Geotextiles, Polypropylene and PVC liners. Mr. Simmons experience includes international work in Canada, England, the Bahamas and the United Arab Emirates.

Experience and Employment Background

2005 – Present American Environmental Group, Ltd , Richfield, Ohio

Geosynthetics Supervisor

2004 - 2005 Geo-Synthetics, Inc., Waukesha, WI

Project Manager

Mr Simmons was responsible for all aspects of construction on installation projects throughout the United States Mr Simmons managed between 2 and 8 geosynthetic crews on a continual basis His duties included P&L management, materials management, crew scheduling, daily coordination with clients, invoicing of contracts and extra work items and was responsible for overall client satisfaction His duties also included interviewing, screening, and selecting candidates for employment

2002 – 2003 COMANCO Environmental Corporation, Baton Rouge, LA Project Manager

Mr Simmons was responsible for all aspects of construction on installation projects in his Southeast Region Mr Simmons managed between 2 and 6 geosynthetic crews on a continual basis. His duties included P&L management, materials management, crew scheduling, daily coordination with clients, invoicing of contracts and extra work

items and was responsible for overall client satisfaction

Serrot International, Inc. / National Seal Company, Baton Rouge, LA Mr. Simmons held position of increasing responsible from **Superintendent** to **Project Manager** and was responsible for the supervision of field geosynthetics installation crews of 10 to 45 technicians and laborers. Mr. Simmons successfully, completed installations in the U.S., Canada, England, the Bahamas and the United Arab Emirates. He also coordinated project duties with other

on-site contractors to meet required guidelines and goals



Trevor Simmons Page 2

1990 – 1992 Geosyntec Consultants, Consulting Engineers, Boca Raton, FL

Sr. Engineering Technician

Mr Simmons was responsible for the documentation of all relevant aspects of landfill construction. He reviewed material certifications to ensure compliance with project specifications. He coordinated daily with the owner, earthwork contractor, and installation contractor. He facilitated problem / resolution meetings as necessary. Mr Simmons performed on-site testing of materials. He prepared documentation for inclusion into final reports for submittal to state regulatory agencies for approval.

1989 – 1990 National Seal Company, Galesburg, IL

Sr. Technician

Mr Simmons was responsible for the installation of various liner systems including HDPE, LLPE, Polypropylene, VLDPE, and PVC Capable of operating all types of geosynthetic welding equipment

Academic / Training Background

- OSHA 40 Hour Training Course CFR 1910 120
- OSHA 8 Hour Refresher Training CFR 1910 120
- OSHA 8 Hour Supervisor's and Competent Person Training CFR 1910 120
- Multiple Project Management Training Course 8 Hours
- IAGI Certified Welding Technician
- Certified, Troxler Nuclear Moisture Density Gauge
- Instructor Top Driver Defensive Driving Course
- Instructor Wisconsin LiftTruck Operators Training Course
- Instructor RUST 40-Hour Hazardous Materials Certification Course in compliance with OSHA 29CFR1910 1200
- Certified, Caterpillar Operator Training, Medium Wheel Loaders
- U S Army Combat Medical Specialist

Additional Equipment Operated:

- Wheel Loaders various sizes
- Bobcat Loaders various sizes
- Backhoe/Loader combination various sizes
- Forklifts rubber tired various sizes
- Excavators various sizes



Resume of Qualifications

Deth Phakonekham

Professional Qualifications

Deth Phakonekham possesses over 14 years experience in landfill geosynthetic industry During that period he has performed and supervised numerous geosynthetic installation He has experience supervising the installation of HDPE, LLDPE, XR5, Geosynthetic Clay Liners, Geocomposite, Geonets, Geotextiles, Polypropylene and PVC liners

Experience and Employment Background

2005 - Present

American Environmental Group, Ltd , Richfield, Ohio

Geosynthetic Supervisor.

Mr Phakonekham supervised geosynthetic crews with up to 16 technicians Mr Phakonekham is responsible for fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, XR-5, PVC and Geosynthetic Clay Liners Capable of operating PWT Mouse, Sierra Dynamics Extrusion Welders, Demtech

Welders, and Leister machines

<u>2003 – 2005</u>

Geo-Synthetics, Inc , Waukesha, WI

Geosynthetic Supervisor

Mr Phakonekham supervised geosynthetic crews with up to 45 technicians His responsibilities included fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, PVC and Geosynthetic Clay Liners He has operated National Seal Smart Mouse, Columbine Extrusion and Fusion Welder and Leister welders

1992 - 2003

National Seal Company / Serrot International / GSE Lining

Technologies, Houston, TX

Mr Phakonekham held positions of increasing responsibility to Geosynthetic Supervisor. His duties included Foreman responsibilities running geosynthetic crews with up to 16 technicians, and has worked on various types of installations including HDPE, LLPE, and PVC Operated Gundle Hotwedge, X-10 Leister, Gundle

Extrusion Welders

Academic / Training Background

- OSHA 40 Hour Training Course CFR 1910 120
- OSHA 8 Hour Refresher Training CFR 1910 120
- IAGI Certified Welding Technician



Resume of Qualifications Deth Phakonekham Page 2

Additional Equipment Operated:

- Front-end Loader
- Backhoe/Loader combination
- Bobcat Loaders various sizes
- Posi-tracks
- JCB Backhoe/Loader combination various sizes
- Forklifts rubber tired various sizes
- Excavators various sizes
- Small Bulldozers



Resume of Qualifications

Eleazar Garza, Jr.

Professional Qualifications

Eleazar Garza possesses over 13 years experience in landfill geosynthetic industry During that period he has performed and supervised numerous geosynthetic and pipe installation projects. He has experience supervising the installation of HDPE, LLDPE, XR5, Geosynthetic Clay Liners, Geocomposite, Geonets, Geotextiles, Polypropylene and PVC liners. Mr. Garza has also installed numerous HDPE piping projects throughout the United States.

Experience and Employment Background

2005 – Present American Environmental Group, Ltd , Richfield, Ohio

Geosynthetic Supervisor.

Mr Garza is responsible for supervising geosynthetic crews with up to 16 technicians. He is also responsible for fabrication and installation of various liner systems including. HDPE, LLPE, Polypropylene, XR-5, PVC and Geosynthetic Clay Liners. Capable of operating PWT Mouse, Sierra Dynamics Extrusion Welders, Demtech Welders, and

Leister machines

2004 – 2005 COMANCO Environmental Corp., Tampa, FL

Geosynthetic Supervisor

Mr Garza supervised geosynthetic crews with up to 15 technicians His responsibilities included fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, PVC and Geosynthetic Clay Liners Operated Columbine Extrusion and Fusion

Welder and Leister welders

1997 – 2004 Environmental Specialties International, Baton Rouge, LA

Geosynthetic Supervisor

Mr Garza's duties included Foreman responsibilities running geosynthetic crews with up to 15 technicians. Worked on various

types of installations including HDPE, LLPE, and PVC

1993 – 1997 National Seal Company, Baton Rouge, LA

Geosynthetic Foreman

Mr Garza was employed as a Foreman running geosynthetic crews with up to 15 technicians Worked on various types of installations

including HDPE, LLPE, and PVC



Resume of Qualifications Eleazar Garza, Jr. Page 2

Academic / Training Background

- OSHA 40 Hour Training Course CFR 1910 120
- OSHA 8 Hour Refresher Training CFR 1910 120
- IAGI Certified Welding Technician

Additional Equipment Operated:

- Front-end Loader
- Backhoe/Loader combination
- Bobcat Loaders various sizes
- Posi-tracks
- JCB Backhoe/Loader combination various sizes
- Forklifts rubber tired various sizes
- Excavators various sizes
- Small Bulldozers



Resume of Qualifications

Glenn Beeman

Professional Qualifications

Glenn Beeman possesses over seven years experience in landfill geosynthetic industry During that period he has performed and supervised numerous geosynthetic and pipe installation projects. He has experience supervising the installation of HDPE, LLDPE, XR5, Geosynthetic Clay Liners, Geocomposite, Geonets, Geotextiles, Polypropylene and PVC liners. Mr Beeman has also installed numerous HDPE piping projects throughout the United States.

Experience and Employment Background

2002 – Present American Environmental Group, Ltd , Richfield, Ohio

Geosynthetic Supervisor

Mr. Beeman supervises geosynthetic crews with up to 16 technicians Mr Beeman is responsible for fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, XR-5, PVC and Geosynthetic Clay Liners Capable of operating PWT Mouse, Sierra Dynamics Extrusion Welders, Demtech Welders, and Leister

machines

2001 – 2002 Geo-Synthetics, Inc., Waukesha, WI

Geosynthetic Foreman

Mr Beeman's duties included Foreman of geosynthetic crews with up to 15 technicians. His responsibilities included fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, PVC and Geosynthetic Clay Liners. Operated

Columbine Extrusion and Fusion Welder and Leister welders

1999 – 2001 Mid America Lining Company, Union City, TN

Senior Technician

Mr Beeman's duties included fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, PVC and Geosynthetic Clay Liners Operated Columbine Extrusion and Fusion

Welder and Sun welders



Resume of Qualifications Glenn Beeman Page 2

Academic / Training Background

- OSHA 40 Hour Training Course CFR 1910 120 OSHA 8 Hour Refresher Training CFR 1910 120

Additional Equipment Operated:

- Front-end Loader
- Bobcat Loaders various sizes
- Posi-tracks
- Forklifts rubber tired various sizes
- Excavators various sizes
- Small Bulldozers



Resume of Qualifications

Mike Beeman

Professional Qualifications

Mike Beeman possesses over 18 years experience in the geosynthetics industry. He has managed, supervised, and installed over hundreds of millions of square feet of numerous types of geosynthetic material for all major projects. He has performed and supervised projects ranging up to 10,000,000 square feet internationally. He has extensive experience in the installation of high and low density polyethylene, polyvinyl chloride, polypropylene, XR5, geotextiles, geocomposite and other related products

Experience and Employment Background

American Environmental Group, Ltd , Richfield, Ohio 2008 - Present

Geosynthetic Supervisor

Mr Beeman supervises geosynthetic crews with up to 16 technicians Mr Beeman is responsible for fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, XR-5, PVC and Geosynthetic Clay Liners Capable of operating PWT Mouse, Sierra Dynamics Extrusion Welders, Demtech Welders, and Leister

machines

<u>2004 – 200</u>8 Clean Air and Water Systems, Dousman, WI

Geosynthetic Supervisor

Mr Beeman played a key role in the substantial growth of the firm's geosynthetic installation. He was responsible for hiring, training and supervising his employees in the geosynthetic installation division

Geo-Synthetics Inc., Waukesha, WI 1999 – 2004

Geosynthetic Supervisor

Mr Beeman installed numerous types of geosynthetic materials for field operations covering over 20 states and he supervised all aspects of the installation process over 10,000,000 square feet of

geosynthetics annually

1996 - 1999 Mid-America Lining Co, Union City, TN

Geosynthetic Supervisor

Mr Beeman supervised and installed numerous amounts of geosynthetic materials from projects ranging up to 10,000,000 square feet with a crew well over 20 people. His efforts were to modify and improve techniques for the liner as well as seaming and welding



Resume of Qualifications Mike Beeman Page 2

<u> 1990 – 1996</u>

National Seal Company, Cranberry Twp , PA National Seal Company (East Northern Territory) Hong Kong **Technician, Supervisor, Manager - Geosynthetics**

Mr Beeman started as a technician installing numerous amounts of geosynthetic materials from projects ranging up to 10,000,000 square feet. His efforts modify him to manage materials and supervisor for operations covering 20 states and internationally a crew well over 65 employees in Hong Kong. Mr Beeman provided techniques for liner as well as seaming and welding

Academic / Training Background

- OSHA 40 Hour Training Course CFR 1910 120 & 1926 65
- OSHA 8 hour Refresher Training CFR 1910 120
- 40 Hour MSHA
- Heavy Equipment Training
- CPR/First Aid Training

Project Types/Additional Equipment

- Heap Leach Pads
- Landfill Cells and Caps
- Decorative Ponds
- Manure Ponds
- Secondary Containment Structures
- Under-liners and Methane Barriers
- Front end Loaders
- Back Hoes
- Bobcats
- Posi-tracs
- · Off Road Forklifts
- Excavators
- Bulldozers



Resume of Qualifications

Jeremy Olivier

Professional Qualifications

Jeremy Olivier possesses over 16 years experience in the geosynthetics industry He has supervised, and installed over millions of square feet of numerous types of geosynthetic material for major manufactures and installers. He has performed and supervised projects ranging up to 10,000,000 square feet. He has extensive experience in the installation of high and low density polyethylene, polyvinyl chloride, polypropylene, XR5, geotextiles, geocomposite and other related products

Experience and Employment Background

<u> 2008 – Present</u> American Environmental Group, Ltd , Richfield, Ohio

Geosynthetic Supervisor

Mr Olivier supervises geosynthetic crews with up to 16 technicians Mr Beeman is responsible for fabrication and installation of various liner systems including HDPE, LLPE, Polypropylene, XR-5, PVC and Geosynthetic Clay Liners Capable of operating PWT Mouse, Sierra Dynamics Extrusion Welders, Demtech Welders, and Leister

machines

2005 - 2008G S E Lining Technology, Inc Houston, TX

Geosynthetics Foreman

Mr Olivier played a key role in the substantial growth of the firm's geosynthetic installation. He was responsible for, training and supervising his employees in the geosynthetic installation division

2001 - 2005 Environmental Specialties Inc., Baton Rouge, LA

Construction Foreman - Geosynthetics

Mr Olivier Operated and maintained the geosynthetic materials and equipment for field operations covering over 15 states and he supervised all aspects of the installation process over 10,000,000

square feet of geosynthetics annually

1992 - 2000National Seal Company Cranberry Twp, PA

Technician / Welder - Geosynthetics

Mr Olivier was a fusion extrusion welder He welded well over the was in training with a crew well over 15 people. His efforts were to modify and improve techniques for the liner as well as seaming and

welding



Resume of Qualifications Jeremy Olivier Page 2

Academic / Training Background

IAGA Certified Welding Technician
OSHA 40 Hour Training Course – CFR 1910 120
OSHA 8 hour Refresher Training – CFR 1910 120
Hertz Heavy Equipment Training
CPR/First Aid Training

Project Types/Additional Equipment

- · Landfill Cells and Caps
- Secondary Containment Structures
- Under-liners and Methane Barriers
- Front end Loaders
- Back Hoes
- Bobcats
- Posi-tracs
- Off Road Forklifts
- Excavators
- Bulldozers



Resume of Qualifications

Dave Ventress

Professional Qualifications

Dave Ventress possesses over 20 years experience in landfill geosynthetic industry During that period he has performed and supervised numerous geosynthetic installation projects totaling hundreds of millions of square feet. He has experience supervising the installation of HDPE, LLDPE, XR5, Geosynthetic Clay Liners, Geocomposite, Geonets, Geotextiles, Polypropylene and PVC liners.

Experience and Employment Background

2008 – Present American Environmental Group, Ltd , Richfield, Ohio Supervisor – Geosynthetics

1988 – 2009 Gundle Lining Technologies - Houston, Texas Supervisor – Geosynthetics

Mr Ventress worked over 20 years with Gundle Mr Ventress technical experience includes research and development of Gundle's extrusion and fusion welders and as Gundle grew and merged with S L T Mr Ventress all so worked with many of the Gundle crews and supervisors to make a smooth transition from the Gundle welder to the new and better Columbine welders and than as G S E switch from the Columbine welder over to all P.WT equipment While with G S E Mr Ventress has supervised crews as large as 45 techs and has installed many projects over 5,000 000 sq ft of all types of geosynthetic materials and from many different manufactures

1981 – 1988 A R C O Oil and Gas Production - Corpus Christi, Texas Project Supervisor

While as a subcontract hand with ARCO, Mr Ventress helped with the start up of two very large offshore production platforms #703 and #668 Mr Ventress helped monitor all oil and gas production Later Mr Ventress was promoted to night man on the platform witch he was the only one awake all night to keep the platform running While working offshore Mr Ventress received a 40 ton crane license

Academic / Training Background

- 40 Hour Hazwoper
- 8 Hr Hazwoper refresher (annually)
- 8 Hr OSHA Safety Training
- First Aid and CPR Training
- IAGI Certified Welding Technician



Resume of Qualifications Dave, Ventress Page 2

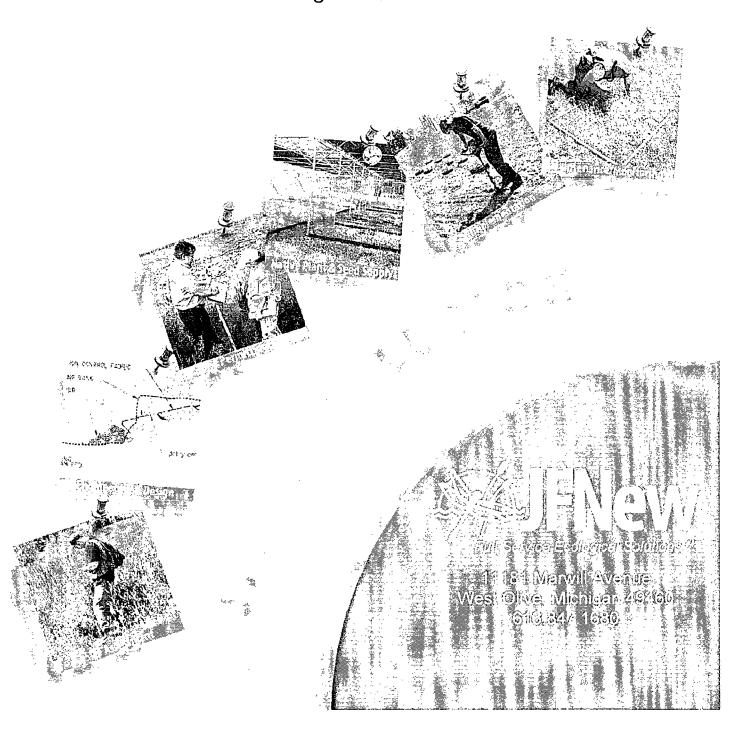
Additional Equipment Operated:

- Front-end Loader
- Backhoe/Loader combination
- Bobcat Loaders various sizes
- Posi-tracks
- JCB Backhoe/Loader combination various sizes
- Forklifts rubber tired various sizes
- Excavators various sizes
- Small Bulldozers

Statement of Qualifications

Prepared for Arcadis

August 21, 2009





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<u>Cincinnati, Ohio</u> 513 489.2402 fax 513 489 2404

Madison, Wisconsin 608 848 1789 fax 608 848.3013

Native Plant Nursery 574.586 2412 fax 574 586.2718

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Contents

- 3 JFNew Full-Service Ecological Solutions
- Project Experience



JFNew Corporate Overview



JFNew was founded in 1989 to help clients navigate environmental regulations and work with regulatory agencies to obtain wetland permits and implement successful mitigation. Since then, we have grown and diversified to become a full-service ecological solutions provider for clients seeking assistance in sustainable site design, green infrastructure implementation, ecological restoration and mitigation, coastal and watershed management, permitting and natural areas site maintenance.

Our corporate headquarters and 100+ acre native plant nursery are located in northern Indiana, with a network of satellite offices throughout the Great Lakes region. The JFNew team includes experienced wetland and wildlife biologists, environmental scientists and engineers, landscape designers, hydrologists, ecologists, native plant specialists and cultural resource professionals dedicated to client service and environmental stewardship

JFNEW'S APPROACH - Full-Service Ecological SolutionsTM

JFNew's emphasis is to provide a full-service ecological solution, which helps to improve the success rate of restoration projects. Starting with a detailed site analysis, our team of scientists can customize project designs and specifications to match site conditions and then create an implementation and maintenance plan that allows the new ecosystem to establish itself and succeed over time. Below is a summary of the services JFNew's experienced team of wetland and wildlife biologists, environmental scientists, environmental engineers, landscape architects, hydrologists, ecologists, cultural resource and native plant specialists can provide:

Ecological Site Assessments and Studies

- Wetland determination and delineations
- Ecological assessments & surveys
- Threatened and endangered species surveys
- GPS/GIS data collection and management
- Biological inventories

Ecological Engineering and Design

- Stormwater design
- Wetland, lake and stream design
- Bioengineering and shoreline stabilization
- Wastewater treatment wetlands

Permitting

- US Army Corps of Engineers / 404
- State wetland, 401 and isolated wetlands
- Cultural Resources
- Endangered species

Native Plant and Seed Supply

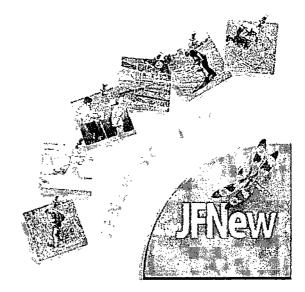
- Wetland, prairie, woodland
- Materials grown from pure live seed
- Bioengineering materials

Ecological Restoration and Implementation

- Wetland, stream, prairie establishment
- Bioengineering
- Native landscaping
- Construction and construction oversight

Site Management and Maintenance

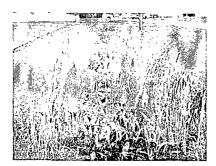
- Invasive and exotic species control
- Prescribed burning
- Mitigation & restoration monitoring







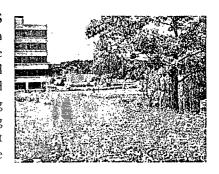




GREEN INFRASTRUCTURE Alternative stormwater Best Management Practices (BMPs), such as bio-swales and rain gardens, can provide natural stormwater runoff solutions and can minimize the strain on traditional infrastructure while improving the quality of water and ecosystems. JFNew has significant experience in green infrastructure design, engineering and implementation, and can provide a scientific site analysis, create a customized project specification and implement the plan to ensure system capacity is optimized over the life of the project.

SUSTAINABLE SITES, CAMPUSES AND NEIGHBORHOODS

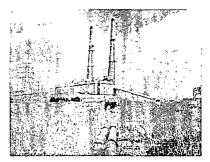
JFNew helps clients sustainably manage their natural resources on academic, corporate, medical and government campuses to minimize water usage, reduce stormwater discharge, improve energy efficiency and restore and beautify natural areas for the enjoyment of the occupants and visitors. For example, converting turf grass areas to native landscaping reduces irrigation needs, limits chemical treatments, and reduces moving and the associated carbon emissions. This type of natural enhancement helps lower operating costs while at the same time restoring native habitats that contribute to occupant wellness and productivity.





ECOLOGICAL RESTORATION AND MITIGATION The need for ecological restoration is growing due to human and natural activities that damage or destroy landscapes and native habitats. Pressure from population growth and changes in climate are increasing the urgency of restoration in areas such as wetlands, streams, coastal areas and migratory routes. JFNew uses a scientific approach to design and implement restoration plans that results in the enhancement of thousands of acres of sensitive areas and native landscapes.

LINEAR CORRIDOR CONSULTING The energy, transportation and recreation sectors face a unique set of environmental challenges in their linear corridor projects. JFNew's experience in this segment is extensive, with demonstrated results in site analysis, permitting, mitigation and construction oversight. We have assisted in obtaining permits on hundreds of miles of pipeline and overhead utility projects, and have provided construction oversight to ensure projects proceed on schedule with the smallest possible environmental impact

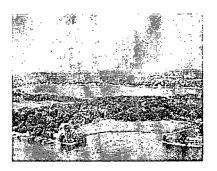


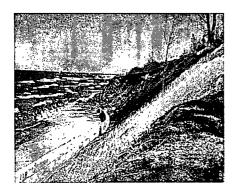




Applications of JFNew Solutions (cont'd)

WATERSHED, LAKE AND STREAM ENHANCEMENT Issues of water availability, water quality and flooding have gained prominence in light of development growth and climate change. The ecological team at JFNew recognizes the importance of managing these challenges at the regional level and has an experienced team of aquatic and watershed biologists, hydrologists and engineers in place to provide practical solutions. JFNew conducts watershed, lake and stream studies and master plans to identify causes of water quality impairment and habitat loss. Our team can then design and implement measures to enhance water quality and restore natural habitat.





COASTAL RESOURCE MANAGEMENT Coastal preservation issues create challenges in both developed and natural areas. JFNew's approach to these challenges is based on a recognition that both natural processes and environmental regulations are in play for coastal projects. JFNew's team of experienced professionals is recognized as leaders in coastal zone management issues. Our expertise includes critical dune protection and management, high-risk erosion area restorations, rare, threatened and endangered species surveys, bluff stabilization, native landscaping and restoration, site planning in sensitive areas and local planning/zoning support.

CULTURAL RESOURCE MANAGEMENT Many times, restoration or development projects occur in sites that contain artifacts of historical value. When this occurs, projects can become stalled by regulatory requirements or backlash from concerned stakeholders. JFNew has an experienced team of Cultural Resource Managers with the capability to do site assessments, assist with preservation and documentation of archaeological assets and expedite the permitting process to keep projects moving forward.





Project Experience



Kalamazoo River Restoration

Project Location: Michigan

Owner/General Contractor: Arcadis

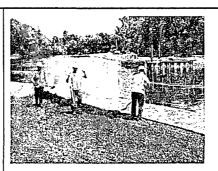
Fees Earned: \$ 678,825 00

Completion Date: Ongoing

Project Manager or Principal-in-Charge: Brian Majka

Services Provided:
Bioengineering
Remediation
Restoration





JFNew was contracted to implement the upland and stream habitat restoration plans for this remediation project. The contaminants were primarily retained within the site soils, therefore requiring a combination of excavation and slurry wall construction to remediate the site. Completing the remediation task required significant soil disturbance, including impacts to the banks of the Kalamazoo River bordering the site. JFNew completed the finish grading of the disturbed areas following decontamination then stabilized and seeded the areas with a custom mixture native grasses and wildflowers appropriate for the site. The river bank was stabilized and enhanced using bioengineering techniques. Additionally, JFNew completed shoreline and in-stream habitat improvements that were required conditions of the necessary permits. The finished project converted a site which was detrimental to flora and fauna and converted it to a property which can be developed for local economic benefit, while also providing additional upland and stream habitat.



Project Location: Chesterton, Porter County, Indiana

Owner/General Contractor: Lake Erie Land Company

Services Provided: Assessment Bioengineering Botanical Survey Conservation Design-LEED Construction Design Services Engineering Feasibility Study Hydrological Lakes/Streams Maintenance Master Plan Monitoring ative Landscaping Nursery Permitting Restoration

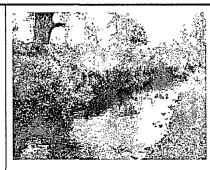
Stormwater

Wastewater

Watershed

Woodland

Wetland Delineation





This development in northwest Indiana highlights environmental restoration as an integral part of a 640-acre mixed use community based on innovative sustainability concepts. JFNew was involved with all environmental issues of site planning including evaluating topography, soils and hydrology of the prairies, wetlands and woodlands, and determining species appropriate for restoration sites

In keeping with the client's commitment to treat all water on the site, JFNew conducted a feasibility analysis to determine areas most suitable for construction of subsurface flow wastewater treatment wetlands Based on the findings, JFNew coordinated with the development team to prepare a wastewater treatment master plan Currently, treated wastewater is piped to an absorption area or "biofield" planted with deep rooted native grasses and flowers

JFNew also worked with the project team to develop a natural system to use the existing soils and introduced native prairie plants to treat all stormwater on-site and keep road salt and other contaminants out of Coffee Creek. The solution utilizes more than a mile of "level spreaders," a series of underground pipes and gravel infiltration areas under the restored prairies. As the water percolates slowly through the soil it is purified by biological activity within the root zone

IFNew restoration efforts included utilizing bioengineering techniques to restore the natural meanders and gravel bed of a trout and salmon stream, and restoring a bottomland forest. JFNew is also in charge of the long-term maintenance and management of all natural areas and has a dedicated restoration management specialist based on-site



Project Location: Northeast, Indiana

> Owner/General Contractor: Indiana DOT

Services Provided:

Design Services

Mittgation

Monitoring

Native Landscaping

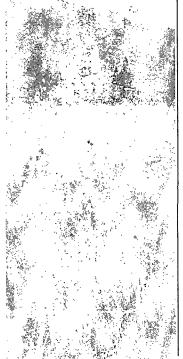
Permitting

Restoration





JFNew provided turn-key wetland mitigation services, including all phases of design and construction for 110 acres of wetland mitigation and 27 acres of upland buffers. JFNew located potential wetland sites and evaluated surface and subsurface hydrology, soils and topography. JFNew coordinated landowner contacts and negotiations for purchase or lease, real estate appraisals and boundary surveys. The turn-key wetland mitigation also includes grading and planting plans, permit applications with state and federal agencies and coordination and supervision of all work by surveyors and excavators Following construction, JFNew provided and installed native plants and seed mixes in the wetland and upland areas and monitor development for five years JFNew's project management included attendance at meetings and preparing reports to Indiana Department of Transportation, Indiana Department of Environmental Management and the US Army Corps of Engineers



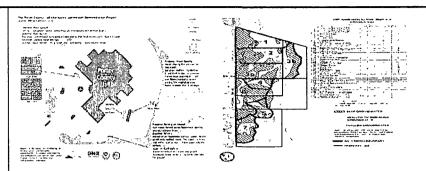
On a separate wetland mitigation area constructed by Indiana Department of Transportation, JFNew developed the construction, planting and monitoring plans and conducted the monitoring for the specified five-year period. In addition, JFNew's restoration management division provided selective herbicide applications to control noxious Canada thistle on this site.

Stimson Drain

Project Location: Valparaiso, Porter County, Indiana

Owner/General Contractor: City of Valparaiso, Indiana

Services Provided: Stormwater



JFNew assisted the City of Valparaiso in obtained a grant to address stormwater issues associated with a quickly growing area within the Valparaiso city limits JFNew worked with an engineering firm to develop an alternative stormwater management plan that encourages utilization of Alternative Best Management Practices (ABMPs) in order to manage stormwater onsite.

JFNew also assisted Valparaiso in obtaining a second grant to implement a stormwater demonstration project at the headwaters of the watershed. The grant provided the opportunity for JFNew to design and construct various stormwater ABMPs within the sub-watershed area. The demonstration project incorporated numerous ABMPs into the stormwater treatment process for effective onsite water quality and quantity management

Initial monitoring indicates onsite stormwater management (zero offsite discharge) for an approximate 2 year, 24 hour storm event JFNew collaborated with Valparaiso University to broaden the positive local impact and educational opportunities of the project.



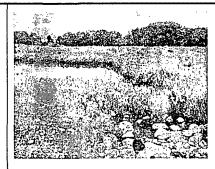


Project Location: Frankfort, Will County, Illinois

Owner/General Contractor: Village of Frankfort, Illinois



Bioengineering
Construction
Design Services
Invasive/Exotic
Lakes/Streams
Prairie
Restoration
Stormwater





JFNew designed and constructed the innovative \pm 13-acre village of Frankfort Prairie Park JFNew provided design and implementation of native landscaping and restoration management on the project in 2001-2002 and continues to be involved with maintenance and monitoring services for the site. The concept behind the design of the project was to preserve and enhance an existing prairie remnant while providing passive recreation, natural areas education, as well as a naturalized stormwater treatment facility for the downtown area of Frankfort In 2003, this project was awarded the Conservation and Native Landscaping Award from the USEPA and Chicago Wilderness for outstanding efforts in using native plants in the landscape.

The final design included restoration and creation of a total of nine acres of native tall grass prairie, three acres of wet prairie and a fishing pond with native emergent vegetation lining the shorelines. A botanical inventory of an approximately one-acre high-quality remnant prairie, which was incorporated into the development plan for the site. The botanical inventory was conducted using meander survey methodology, in addition to photographic monitoring. Plant species recorded in the inventory included several conservative prairie remnants.

Frankfort Prairie Park successfully combines aesthetics and function by incorporating BMPs consisting of natural and hard armored swales and sediment basins as well as 300 feet of recirculating stream. The native vegetation within the natural treatment system facilitates absorption and biochemical breakdown of pollutants and excess nutrients. In addition to the functions of the treatment system, the park also provides education and recreation opportunities while demonstrating resource management through a best management approach to stormwater management and treatment



Project Location: Glencoe, Illinois

Owner/General
Contractor:
Chicago Botanic Garden

Services Provided: Native Landscaping





JFNew was responsible for the installation of the Lakeside Aquatic portion of the "Gardens of the Great Basin" at the Chicago Botanic Garden (owned by the Forest Preserve District of Cook County, Illinois). Our experienced team of restoration specialists installed over 50,000 native and ornamental aquatic plants such as bulrush, sedges, iris, water lilies, and lotus to create the largest aquatic display garden in the United States. These plants were installed within innovative geo-web and bent hic mesh materials designed to work with the plants to create stable shorelines and prevent long-term erosion

In addition to the Great Basin, JFNew installed over 20,000 plants and shrubs as part of the Garden's 319 shoreline restoration project as well as 150 prevegetated wetland coir fiber pallets along a 300 foot section of Evening Island, a five acre native plant paradise designed to showcase native prairie species in broadly sweeping landscape arrangements.

This project has received acclaim from industry experts and general public alike. The highlight of the Botanic Garden's 30th anniversary celebration, the opening of the Gardens of the Great Basin drew the highest weekend attendance on record and promises to be a perennial popular visitor destination. Together with Evening Island and the 319 shoreline project, the Gardens of the Great Basin serves as a national example for the utilization of native plants for shoreline stabilization as well as an unrivaled showcase of their beauty, diversity, and suitability for environmentally friendly landscape applications.



Project Location: Ionia County, Michigan

Owner/General Contractor: State of Michigan Management & Budget

Services Provided:
Bioengineering
Erosion-Shoreline
Lakes/Streams

According to a Consent Agreement reached March 29, 2001, between the Department of Management and Budget (DMB) and the Department of Environmental Quality (DEQ), remedial and restoration activities at the Bellamy Creek Correctional Facility were initiated. The intent of the project was to design plans and specifications to restore Inman Creek and adjacent wetland areas impacted by the "unauthorized release of sediment" from construction of the new Correctional Facility. The restoration activities were designed by JFNew with structural engineering support provided by others.

JFNew's charge was to design appropriate resource restoration actions and obtain DEQ approval of the plans and obtain necessary permits under P A. 451 of 1994, as amended Review of proposed action items by DMB/DEQ resulted in a total of thirty-three action items being selected for construction. Of particular note from the thirty-three action items were:

- twelve activities involving wetland enhancement or creation
- fourteen activities involving stream and steam habitat improvements
- four areas of streambank stabilization including on utilizing placement of rock gabion structures
- modifications to rock berm control structures for control of surface water run-off

All measures involved design and implementation of BMPs for improvements to the on-site stormwater management system and to protect and enhance water quality and habitat in the site trout stream

Following successful implementation of the BMPs, JFNew was contracted to develop the MDMB Soil Erosion and Sedimentation Control Guidebook, for MDMB Infrastructure Services, Design and Construction Division Soil Erosion and Sedimentation Control Program JFNew's Certified Stormwater Operators and Landscape Architects worked with MDMB staff to define, develop and produce all drawings, specifications and standards which comprise the MDMB manual. The manual, which provides the standard for soil erosion control measures on all MDMB projects, was the result of JFNew coordination and interaction with MDMB, MDNR and MDOT soil erosion control staff.

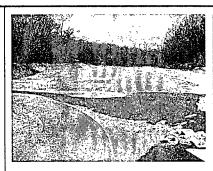


Project Location: Chesterton, Porter County, Indiana

Owner/General Contractor: Troyer Group Inc

Services Provided:

Design Services Erosion-Shoreline Lakes/Streams

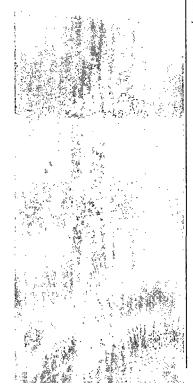




In the 1930s, the Civilian Conservation Corps (CCC) directed Dunes Creek into approximately 500 feet of concrete pipe beneath an area which would eventually become the auxiliary parking lot years after the CCC left the park—Surface runoff from the parking lot was creating erosion and flooding issues for the park. Additionally, the beaches at Indiana Dunes State Park would periodically experience unsafe levels of E coli that were associated with the Creek Although the culvert was not the cause of the pollution, restoration of the creek offered an opportunity to maximize the positive impact on water quality and habitat

IFNew was a subconsultant to the Indiana Department of Natural Resources and provided design and construction oversight services to daylight and restore approximately 800 feet of the Dunes Creek channel. The project required removing approximately 1 acre of concrete and 10,500 cubic yards of sand fill JFNew based the naturally meandering channel plan on historic survey records of the stream, cross sectional and meander geometry upstream, and the available floodplain width Woody debris (cross channel logs) were designed and installed within the bottom of the sand bed channel. JFNew developed the seeding and planting plan for the floodplain based on species found in the upper watershed and coordination with IDNR biologists. An additional purpose served by the project was to evaluate the potential of reducing bacterial pollution downstream at the State Park public beach. Restoring the floodplain to an emergent marsh allowed the sunlight to reduce the coliform levels within the water Educational signage provided by the State Park provided an important element to explain the functions of the natural system and its benefits.

The Indiana Department of Natural Resources received three awards for this project - the 2006 Engineering Excellence award from the Association of Conservation Engineers; the 2007 Conservation and Native Landscaping Award; and the 2007 Governor's Awards for Environmental Excellence in Indiana



Project Location: Wilmington, Will County,

Wılmıngton, Wıll County, Illınoıs

> Owner/General Contractor: Openlands

Services Provided:

Invasive/Exotic Native Landscaping Prairie Wastewater JFNew assisted the U.S. Forest Service for over five years with the restoration of native prairies at the only federally owned property managed solely for the preservation and restoration of a tall grass prairie community. JFNew's initial involvement was cleaning and processing native grass and wildflower seed collected from the site by volunteers. The JFNew Native Plant Nursery stored the cleaned seed until it was installed in restoration areas by Midewin staff.

JFNew also provided woody species control in the prairie restoration areas. Species specific herbicide application techniques were used to maximize woody control while preventing damage to rare species on the site. JFNew and the U.S. Forest Service worked together to develop a management strategy that paired target species with the most effective and appropriate chemicals for control. This strategy required diligent application and identification efforts to maximize control while minimizing risk to non-target species.

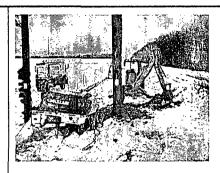
JFNew has also provided natural wastewater treatment design services in association with the administration facilities at the site Because JFNew had a contract with the National Park Service to provide natural wastewater treatment system design services, we were asked to assist Forest Service engineers with the design of a system for the new facilities. JFNew assisted with the sizing and geometry of the system components, details and specifications for construction of the system, and assistance with obtaining necessary permits from the Illinois Health Department.



Project Location:Marshfield, Marathon
County, Wisconsin

Owner/General Contractor: Marshfield Utilities

Services Provided: Construction Observation Threatened/Endangered Survey Wetland Delineation



Wetland Delineation and Habitat Assessment - JFNew conducted wetland delineations, stream crossing identifications, endangered species habitat review and National Heritage Institute database review for an approximately 10-mile transmission line from Stratford Substation to McMillan Substation in preparation of a transmission line upgrade for winter 2006 - 2007. JFNew received U.S. Army Corps of Engineers concurrence with the wetland and waterway delineation

Wetland and Erosion Control Permitting - JFNew coordinated pre-application meetings between the Wisconsin Department of Natural Resources (WDNR) Office of Energy and the Wisconsin Public Service Commission to determine the necessary permits for the project JFNew created an access plan that minimized project impacts to wetlands, waterways and unique resources while accomplishing the goals of the project for Marshfield Utilities JFNew coordinated the receipt of all permits from the U.S. Army Corps of Engineers and WDNR related to wetlands, waterways and erosion control and stormwater management.

Construction Oversight - JFNew provided construction oversight related to the environmental permits received and any environmental issues that may arise during the course of the project. In addition, JFNew provided environmental training for the contractor chosen by Marshfield Utilities to work on this project. Because the project ran through a DNR Wildlife Area, JFNew provided the WDNR property manager with regular project updates.

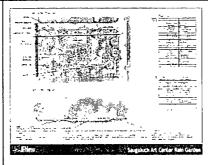


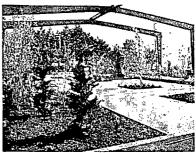
Project Location: Saugatuck, Allegan County, Michigan

Owner/General Contractor: City of Saugatuck, Michigan

Services Provided:

Construction
Design Services
Engineering
Grants
Native Landscaping
Rain Garden
Stormwater





JFNew worked with the Center's project design team to design and implement a natural treatment system to absorb and infiltrate 100 percent of the rain water from the SCA roof thus achieving zero untreated discharge to nearby Kalamazoo Lake

JFNew also designed and constructed a series of stormwater Alternative Best Management Practices (ABMPs) on adjacent City of Saugatuck properties. This included porous pavers and a rain garden/vegetated swale series at Coghlin Park to treat the excess runoff from the city parking lot. The design also incorporated an innovative oil-and-grit separator that removes over 80 percent of sediment and nutrients from the approximately nine acres of urban land. This series of "treatment techniques" demonstrates a variety of innovative and natural alternatives for treatment and reduction of stormwater. JFNew assisted the city in obtaining funding for these stormwater management techniques through a Catalyst Grant and a Clean Michigan Initiative Nonpoint Source Funding challenge grant.





Project Location: Plainfield, Hendricks County, Indiana

Owner/General
Contractor:
Banning Engineering

Services Provided:

Bioengineering
Construction Observation
Design Services
Engineering
Erosion-Shoreline
Hydrological
Lakes/Streams
Modeling
Restoration
Watershed







JFNew was selected to provide design and construction oversight services for the largest Emergency Watershed Protection Program project in Indiana's history. The Town of Plainfield leveraged approximately \$700,000 to obtain approximately \$2.3 million from The Natural Resource Conservation Service (NRCS) for the clean up of White Lick Creek The project was necessitated by the Labor Day flood of 2003 that downed trees, eroded the banks of an old landfill, washed out a trail, and left large amounts of woody debris in the channel and created hazards for bridges. The goal of the project was to use natural channel design techniques and bioengineering to restore the waterway as a recreational and aesthetic asset to the town. In order to develop natural, sustainable solutions, IFNew measured channel slope, cross sections, and degree of incision and identifying sources of channel instability. The three-mile long stream reach is classified as a Rosgen F4 stream with meander patterns beginning to reestablish at a lower thalweg elevation JFNew identified multiple headcuts within the reach, therefore necessitating the use of cross vane like grade controls prior to the initiation of bank stabilization methods JFNew also identified appropriate locations for soil encapsulated lift treatments for bank stabilization and locations to incorporate oversized boulders at the toe of slope to provide smallmouth bass habitat The overall project design, including hard armoring techniques designed by others, was coordinated with the Town Engineer. Following approval, JFNew prepared and acquired the necessary permits from the U.S. Army Corps of Engineers, Indiana Department of Natural Resources, and the Indiana Department of Environmental Management. JFNew provided construction oversight of the bioengineering components of the project and The JFNew Native Plant Nursery provided a majority of the native plant materials utilized

The restored and stabilized reach was tested by a major rain even only three months after completing the construction. The results included only minor damage at two soil lift locations, but all vegetation survived the event. Even more supportive of the design choices, review of the reach following the record flooding in early summer 2008 did not show any signs of damage or instability.

Project Location: Ottawa County, Michigan

Owner/General Contractor: Ottawa County, Michigan - Parks & Recreation

Services Provided:

Bioengineering Construction Design Services Engineering Feasibility Study Hydrological Lakes/Streams Modeling Prairie Restoration





JFNew developed a conceptual plan for the Ottawa County Parks and Recreation Commission to revitalize and restore approximately 500 acres along the Macatawa River The conceptual plan proposed creation of six different wetland types and habitat enhancement of the river corridor. The enhancements included prairie creation, management and expansion of woodlots, identification and enhancement of sensitive areas, coordination of wildlife travel corridors and planning for trails and passive recreational opportunities. The plan also addressed floodplain management issues, including flood peak attenuation and nutrient management and removal. The conceptual plan also identified project phases based on projected budgets and grant funding availability

JFNew was also awarded the contract for developing the final design and preparation of construction drawings for Phase I, which focused on wetland areas to be restored on a 188-acre county park along the Macatawa River. JFNew ensured the design met the NRCS Conservation Reserve Enhancement Program requirements and budget. JFNew prepared planting plans and permit applications for the MDEQ, SESC and NPDES for the park Following receipt of the required permits, JFNew led a pre-bid meeting and provided construction inspections to the chosen contractor. After approval of the construction, JFNew installed approximately 50 acres of native seed throughout the wetland complex.

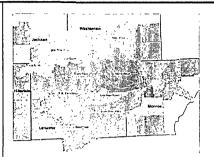
Final design and preparation of construction drawings for Phase II was also awarded to JFNew. This consisted of excavation and re-contouring areas to increase flood storage capacity and creation of 45+ acres of aquatic habitat to improve wildlife habitat and wetland species diversity. Phase II plans also included re-routing and meandering 1,511 feet of stream corridor By creating a serpentine channel with a series of depressions, phosphorous-laden sediment was captured and assimilated by wetland vegetation. Five basins were also created east and west of the channel reroute Implementation of Phase II is pending grant funding



Project Location: Washtenaw County, Michigan

Owner/General Contractor: River Raisin Watershed Council





JFNew has been retained by the River Raisin Watershed Council (RRWC) to help manage the preparation of the River Raisin Watershed Management Plan Together with the RRWC, JFNew prepared the 319 grant application that is the primary funding source for this project. The River Raisin Watershed contains approximately 1,070 square miles of land in southeastern Michigan and a small portion of northwestern Ohio.

Land use in the watershed is primarily agricultural (approximately 65% in 2000) Agricultural and urban non-point source pollution is causing excess erosion and silt-build up in the watershed. In addition, the watershed is beginning to experience extreme development pressures. Growth must be planned and developed in a manner that promotes a healthy economy and a healthy environment. The goals of this plan are to

- Coordinate, inform and improve planning and implementation activities
- Establish eligibility for state and federal grant funds
- Increase stakeholder participation
- Foster stewardship
- Improve river image
- Improve impairments, both 303D listed and TMDL reaches

JFNew will chair the steering and technical committees and help manage the watershed and river assessments and preparation of the plan JFNew will also oversee administration of the 319 grant. The objectives of assessments will be to 1) evaluate the quantity and quality of natural stream, riparian and watershed resources and 2) identify and prioritize problems in the watershed. Flow and water quality data collected in the field will be used to support the development of a watershed model using USEPA's BASIN and SWAT models. A stream walk/canoe survey using the United Stream Assessment protocol developed by the Center for Watershed Protection will be used to identify problem areas. The BASINS/SWAT models will also be used to assess effectiveness and prioritize implementation of watershed best management practices.

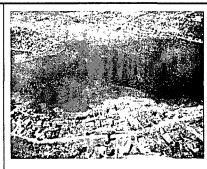


Project Location: Kosciusko and Noble County, Indiana

Owner/General Contractor: Tippecanoe Environmental Lake & Watershed Foundation

Services Provided:

Construction
Design Services
Erosion-Shoreline
Lakes/Streams
Restoration
Watershed





Faced with frequent algae blooms, decreasing water clarity, regular violations of the Indiana state water quality standards for full body contact, and nuisance growth of aquatic vegetation, the Lake Tippecanoe Property Owners' Association contacted JFNew in 1995 to help find solutions to these problems and improve the lake's overall water quality. Since then, JFNew has been working with the property owners' association and subsequently the Tippecanoe Environmental Lake & Watershed Foundation to address water quality issues in the lake and its 113 square mile watershed. JFNew completed a diagnostic study of Lake Tippecanoe in 1997 and a feasibility study of water quality improvement projects in 1998. The Indiana Department of Natural Resources' Lake and River Enhancement Program (LARE) provided the majority of the funding for these two studies.



Each of the four projects examined in the feasibility study have been implemented. In 1999, JFNew designed and supervised the construction of two nutrient and stormwater detention structures on Indian Creek and a sediment trap on the Hanna B. Walker Drain. These structures are designed to sequester nutrients and sediment flowing into Lake Tippecanoe, resulting in improved water clarity and limiting the growth of algae and rooted plants. The following year, JFNew designed and supervised the construction of grade control structures and bank stabilization on a one-quarter mile reach of the Hanna B Hydrological changes in the Hanna B. Walker Drain subwatershed had increased peak volumes and velocities of water in this ditch The elevated peak flow resulted in increased bed and bank erosion in the ditch, contributing sediment to Lake Tippecanoe and reducing water clarity. The grade control structures and bank stabilization greatly reduce the sediment load reaching the lake from this drain. In 2001, JFNew designed and supervised a multi-phase project in the Kuhn Ditch subwatershed A total of 90 acres of habitat were restored adjacent to Kuhn Ditch This work included wetland and prairie restoration, woodland reforestation, and bank and grade stabilization in Kuhn Ditch. Like the other water quality improvement projects described above, this project helps reduce the sediment and nutrient loads reaching Lake Tippecanoe, thereby improving the lake's water quality and reducing the likelihood of nuisance algae blooms and rooted plant growth.

JFNew continues to work in the Lake Tippecanoe watershed, conducting diagnostic and feasibility studies and implementing water quality improvement projects for partner lake associations in the Grassy Creek and Upper Tippecanoe River watersheds. Water quality improvement projects constructed in Lake Tippecanoe's upper watershed include wetland sediment filters on an unnamed drain and a three-acre in-line wetland filter on the Shanton Arm of Elder Ditch, a primary tributary to Grassy Creek and the Tippecanoe River. In addition, JFNew has worked closely with the Tippecanoe Environmental Lake & Watershed Foundation in developing long-term water quality management plans for the lake and its watershed.



Project Location: Various locations, Michigan

Owner/General
Contractor:
US Dept of Agriculture

Services Provided: Design Services Hydrological

Restoration





JFNew was selected to enter into a cooperative agreement with the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) to design and oversee construction of wetland restoration projects under the Wetland Reserve Program (WRP) in the state of Michigan. Under this program, JFNew provides technical assistance to eligible landowners by working with them and NRCS staff to design and restore valuable wetland and wildlife habitat on their properties. Each property has typically been in some form of agricultural use, and feasible options for wetland restoration on each site are identified based on an analysis of existing soils, topography, and hydrology in the project vicinity.

As part of the NRCS WRP process, JFNew designs and engineers a variety of conservation practices including, but not limited to, pushouts, serpentines, ditch plugs, water control structures, and tile breaks. Design and construction plans are completed along with construction specifications and cost estimates. All tasks are completed in accordance with NRCS guidelines and standards

Prior to WRP project construction, JFNew conducts a pre-construction meeting with the landowner, NRCS representative, and selected contractor. Design plans and project expectations are discussed and reviewed at this time. JFNew then conducts periodic construction checks on a project site and also completes a final as-built survey to verify each WRP project is completed as designed.

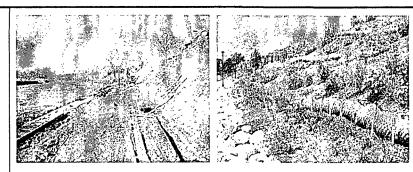
The NRCS and JFNew have mutual interests to conserve, protect, and enhance the nation's wetland ecosystems JFNew is proud to be helping the NRCS work toward their WRP goal of restoring and protecting up to one million acres of wetlands nationally under permanent or 30-year conservation easements Since 2006, JFNew has helped to restore wetlands and wildlife habitat on over 425 acres of WRP easements across the state of Michigan.



Project Location: Mishawaka, St Joseph County, Indiana

Owner/General
Contractor:
Northern Indiana
Construction

Services Provided: Bioengineering Erosion-Shoreline Native Landscaping



The Mishawaka Riverwalk is an urban mixed-use development prominently located along 1.68 miles of the St. Joseph River in downtown Mishawaka The "riverwalk" is a system which takes maximum advantage of its location adjacent to the river and within the Central Business District of Mishawaka by creating views, walkways and community spaces. The purpose of the project was to rebuild this portion of downtown as a gathering/activity place containing commercial, business, residential and public uses. JFNew began involvement with this project by assisting the landscape architect in developing a planting plan for the site using native species throughout. For various reasons, the final landscape plan limited the native species to the St. Joseph River corridor Later, JFNew was brought back in to assist in developing a mitigation plan for the minor impacts proposed.



As the overall project plan was implemented, JFNew was subcontracted to be responsible for the native planting work associated with the river corridor. JFNew provided and installed 5,000 linear feet of biologs with native plant materials already installed Additionally, JFNew planted 20,000 native grass and wildflower plugs, 230, 2" balled and burlap native trees, 550 shrubs, and installed 75,000 square feet of erosion control blanket within the corridor



Project Location: Dayton, Montgomery County, Ohio

Owner/General Contractor: Confidential

Services Provided:
Hydrological
Invasive/Exotic
Native Planting and Seeding
Restoration

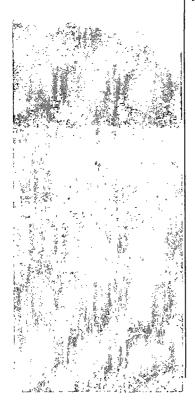




JFNew worked with a leading national retailer to undertake a turnkey design/build wetland mitigation project to restore a high value "fen" ecosystem JFNew assembled an interdisciplinary team of botanists, restoration ecologists, engineers and water resource specialists to develop restoration plans and models to restore this 5 27 acre natural western Ohio fen community

The primary goal of the project was to restore a wetland habitat by re-establishing groundwater hydrology disrupted by agricultural drainage. The innovative design / build solution involved the installation of a unique groundwater interception wall, adjacent stream gradient control structures, microtopographical adjustments and naturalized stormwater swale relocations. As part of the restoration phase, JFNew worked closely to identify and harvest local genotype seed and reproduce it for use on the site through a restoration technique known as "amplification"

Ongoing maintenance, monitoring and preservation of the fen will continue during the regulatory monitoring period, working closely with MetroParks to eliminate exotic species while introducing native plants and amphibian species within the 40 acre MetroPark area

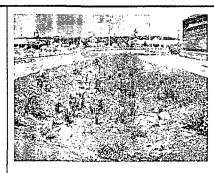




Project Location: Marysville, Union County, Ohio

Owner/General Contractor: CDS Associates

Services Provided: Conservation Design-LEED Maintenance Native Landscaping Stormwater





JFNew partnered with a landscape architect, CDS Associates, to develop an alternative stormwater management plan and ecologically functional treatment practices using a low-impact design approach for the expansion of Union Rural Electric's corporate headquarters in Marysville, Ohio The expansion project, which received the US Green Building Council's LEED Gold Certification upon completion, incorporated numerous sustainable design practices that offset the facility's environmental impact

An integral part of that design package involves the use of rain gardens and bio-retention cells within the expanded stormwater system to reduce and treat non-point source pollution generated from new impervious surfaces. The JFNew/CDS design collects stormwater runoff from buildings, parking lots and surrounding non-permeable surfaces and filters it through a series of rain gardens and bio-retention swales, which are equipped with native vegetation and connected via subsurface drainage layers. These structures not only mimic the site's predevelopment hydrologic functions, they also provide ecological benefits using native vegetation and amended soils to promote filtration and absorption of stormwater runoff before discharging to local waterways. As part of the design-build solution, JFNew provided all materials and labor for the installation which included over 250 linear feet and nearly 1/2 acre of subsurface drainage practices and soil amendments. As part of the installation package, JFNew also supplied and installed all native plant materials and native landscaping as designed by JFNew and facilitated by the LEED process. JFNew continues to provide maintenance oversight services and work with the local property management firm to ensure long-term success of all bioretention areas.





Terra Contracting Statement of Qualifications

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Business Profile

Terra Contracting, L.L.C.

Terra Contracting, LLC is a premier remediation contracting company that provides exceptional environmental services to clients throughout the United States. We have earned a reputation for excellence in handling a wide range of projects that include soil, water and sediment remediation; landfill management; hazardous waste removal; and related services. Terra has developed particular expertise in the area of sediment removal and remediation on major river projects. In 2007, Terra was selected as the prime subcontractor on the Kalamazoo River Superfund project in Michigan, one of three major river projects identified nationally. We work with a wide range of clients across the country including several Fortune 100 companies.

As the remediation industry has developed over the years, Terra has grown with it, even helping to advance its practices through our own contributions. Our company's roots reach back to 1952 and through the decades, we have acquired a wealth of industry knowledge and experience.

Terra takes great pride in the quality and safety of our work, which is sustained by a unique management philosophy. This philosophy has been tested and refined for more than 50 years to become six operating principles, which serve as the foundation of Terra today. All decisions and actions at Terra are based on these principles. They are. Integrity, Safety, Customer Focus, Intensity, Training and Teamwork.

Because we apply our six principles to all projects, we tend to attract customers who appreciate and value exceptional performance and safety. These customers include engineering and consulting firms, private industry, utilities and government agencies. We do assist in designing certain types of remediation projects, but more often we work according to plans developed by engineering and consulting firms. However, once we have engaged a project, we continue to look for operational efficiencies and creative solutions that can eliminate wasted time or materials without compromising quality or safety.

Terra services include.

Remediation Services

Soil and groundwater remediation

Treatment system construction

Landfill capping & maintenance

Facility closures

Facility & equipment decontamination

Above ground & underground storage tank services and removal

Abandoned site cleanup/remediation



Business Profile, cont'd

Terra Contracting, L.L.C.

Remediation Services (continued)

Lagoon Closure and cleanup

Wetland Construction

River bank stabilization

Sewer and pipeline decontamination

Related Construction Services

Site excavation

Sub-grade preparation

Pipeline/sewer line installation

Road construction

Sheet piling

Lagoon construction

Earth moving

Terra has created a team mentality throughout its organization. Our teams are composed of highly qualified personnel in every capacity. Project leaders have gained many years of experience working in multiple industries on a wide range of jobs. Equipment operators are highly experienced and receive continual training. Training is one of our core principles. It is a never-ending process at Terra and ensures that our teams carry the most powerful of all tools: knowledge.

In addition, we have taken great pains to build a real-time communications network and a centralized database so that all teams are linked to each other and to our administrative offices. Information flows freely and changes in job parameters or developments in the field are immediately communicated.

Terra delivers exceptional services by ensuring that each component of the project is of the best possible quality while representing the most cost-effective approach. Great care and thought is given to deployment of equipment and the skill-level of people assigned to projects In the end, it is our deep commitment to our principles that sets us apart from everybody else in our industry.

Steve Taplin—President

Mr. Taplin has more than 25 years experience working in all phases of the environmental services industry. He has direct experience in every phase of the business including management and operations, finance, human resources, marketing, sales, and project supervision and general labor. His experience with remediation projects involves a wide range of industries and scales ranging from under \$100,000 up to several million dollars. He has served as project manager on hundreds of projects involving remediation; industrial deaning, sewer and pipe cleaning and installation, hazardous and non-hazardous waste removal, transportation and disposal, emergency spill response, and municipal services.

Expertise

- Project estimate development
- Project design
- Project scheduling
- Hazardous waste handling
- Regulatory compliance
- Chemical analysis
- Operation and maintenance of a complete range of equipment including excavators, trucks, industrial vacuums, water blasters, jet rodders and others.

- Compliance Management Course on USEPA and USDOT Regulations
- Data Sufficiency and Decision Making for Site Remediation, University of Wisconsin—Madison College of Engineering
- Groundwater Pollution and Hydrology—the Princeton Course
- 40-Hour OSHA HAZWOPER Training



Gary Loveland, P.E.-Vice President

Mr. Loveland has 34 years of experience in civil and environmental engineering. Early in his career, his work involved municipal and highway engineering. This included the design of streets, highways (including interstate highways), bridges, storm sewers, sanitary sewers, pumping stations, force mains and water mains. In addition, his responsibilities have included the design of stormwater management facilities, including drainage channels, detention basins, spillways and outlet structures.

For the last 20 years, Mr. Loveland's main focus has been on environmental projects, particularly land-based projects related to landfills and waste piles. He has provided input in all stages of project development, including identification of project issues, development and screening of conceptual solutions, preparation of detailed plans and specifications, construction oversight, contract administration and project management.

Expertise

- Design and construction of site grading and site utility improvements.
- Permitting of environmental projects, particularly landfills.
- Design and construction of landfills.
- Design and construction of landfill and waste pile closures.
- Project development-from conception to implementation
- Project management
- Strategic project planning
- Regulatory negotiations and liaison
- Budgetary forecasting

- B. S. Civil Engineering, University of Wisconsin—Platteville, 1971
- LPS (Loss Prevention System) Training
- Terra BASICS Training



Rich Anson-Vice President

Mr. Anson has more than 25 years experience in the remediation and construction industries. He has project management experience supervising large crews on a wide range of environmental projects including being the Project Manager on the Kalamazoo River Superfund Cleanup. He has been a skilled equipment operator in a variety of settings including excavation, foundry, nuclear power plants and sewer/pipeline construction. He has also owned and operated his own excavation company where he had full management and operational responsibilities.

Expertise

- River and lake remediation
- Radioactive material handling
- MGP remediation
- Wetland construction and restoration
- Job site supervision
- Landfill capping and cell construction
- Demolition
- Solidification and water treatment experience
- Operating expertise in a wide range of equipment including trucks, excavators, dump trucks and backhoes

- 40-Hour OSHA HAZWOPER Training
- Small business management training
- General radiation training
- LPS (Loss Prevention System) Training
- Terra BASICS Training



Keith Schillo-Vice President

Mr. Schillo has nearly 20 years of experience in safety management. He has had supervisory responsibility for the handling, shipment, treatment and disposal of a wide range of hazardous chemicals and waste including acids and fuels. Mr. Schillo has managed treatment storage disposal facilities; worked extensively with tank trucks and tank cars; supervised the production, pumping, transfer and safe unloading of chemicals, overseen equipment maintenance programs; and monitored fuel and raw material shipments for plant operations. He has also designed and led employee safety training programs. Keith serves as Terra's Corporate Safety Officer, reporting directly to the President.

Expertise

- Safe handling, transfer, transporting and disposal of hazardous waste
- Piping and incineration program design
- Firefighting
- Rail tracking
- Emergency spill response
- Mitigation of hazardous waste release
- Fuel and acid handling
- Safety program design and training
- Waste handling equipment maintenance

- Fuel Handling Course, Texas A&M University
- 40-hour OSHA HAZWOPER Training Purdue University, Lafayette IN. US Steel, Gary IN.
- ERM, Alsip, IL. TTC, Pueblo, CO
- Highway Emergency Response Specialist-40-Hours: TTC, Pueblo, CO
- Confined Space Entry-48-Hours US Steel, Gary, IN.
- State of Indiana-800 Hours-Certified Rescue Firefighter
- LPS (Loss Prevention System) Training
- Terra BASICS Training



Don Hopper—Vice President

Mr. Hopper has more than twenty years of experience in environmental engineering. He has been involved in field inspection and laboratory testing on a wide range of projects including sewer basin overflow; FAA/MDOT/MAC airport renovations; and MDOT and MCRC roadways and bridges. Mr Hopper has served as a field hydrogeologist; has directed quality control and assurance for a variety of building projects, and has extensive experience in landfill management including compliance with MDEQ Type II sanitary landfills. He has also served as safety officer responsible for compliance with OSHA standards. Mr. Hopper leads Terra's Estimating and Technical Operations departments.

Expertise

- Multi-project management/oversight
- Management of landfill operations involving cell containment liners, leachate collection systems, final cover cap installations, gas collection and containment systems
- Bridge, roadway inspection
- Technical hydrogeological investigations for Phase I, II and III Environmental site assessments
- Soil inspection, testing and classification
- Laboratory and field testing of a wide range of materials including soils, concrete, asphalt grout, mortar and steel

- B.S. Geological Engineering, Michigan Technological University, Hydrogeology
- B.S. Environmental Engineering, Michigan Technological University, Hazardous Waste Management
- Hazardous Waste Manifesting
- 40-Hour EPA 165.5 Hazardous Material Incident Response Operations Course
- 80 Hour Hazardous Materials Technician Course (Emergency Responder)
- Surveying capabilities⁻ Robotic Total Station, Topcon Hiperlite Plus, GR-3 w/3DXi Machine Control, Auto-Cad, Edgepoint 3-D
- Operating expertise with a wide range of equipment including operating excavators, dozers, scrapers, front loaders, compactors, and Bobcats
- LPS (Loss Prevention System) Training
- MSHA Part 46 Trained, Confined Space Entry
- OSHA 500—Train the Trainer Certificate
- Central Plastics-Factory Certified Electro Fuse LDC Trainer



Steve A. Taplin—Vice President

Mr. Taplin has over 20 years of experience in the industrial cleaning and municipal services industries. He is experienced in operating and maintaining high pressure water blasting equipment, high-velocity industrial wet/dry vacuum trucks, tankers, roll-off units, combination sewer cleaners and closed circuit TV units. His field experience includes mechanic, laborer, truck driver, equipment operator, crew leader, project management and currently co-owner of Downunder Municipal Services and Vice President of Operations of Terra I/S. As Vice President, he is experienced and actively involved with accounting, customer relations, marketing, estimation and day to day operation of the company.

Expertise

- Vice President of Operations
- Project Manager
- Crew Leader
- Equipment Operator
- Mechanic

- 40-Hour HAZWOPER Training
- 8-Hour Refresher Training
- CPR/First Aid Training
- Confined Space Training
- CDL License, Class A with doubles and tanker endorsements
- PACP/MACP Certified (Pipeline/Manhole Assessment Certification Program)
- Certified Commercial Pesticide Applicator
- LPS (Loss Prevention System) Training



Mark LaRowe—Senior Client Services Manager

Mr. LaRowe has over 18 years of experience in the environmental consulting and construction industry. He has held various positions in his career ranging from junior-level field/project oversight to Division General Manager for a mid-size remedial contracting company. Mr. LaRowe is well versed in most aspects of remedial construction, hazardous waste site investigation, project construction management, industrial/deep cleaning services, project estimating, set-up and project implementation. He also has extensive experience in proposal writing, customer/business development, client relations, project and business unit level financial management and staff management.

Expertise

- Tank excavation / removal and site closure
- Facility Demolition
- RCRA closures & lagoon closures
- Groundwater & soil remediation system installation
- Water treatment systems
- Landfill leachate collection, pumping & transfer system construction
- Landfill capping, cell construction & maintenance
- In-situ heavy metal stabilization
- Facility Decommissioning / Decontamination involving PCB's, Cyanides, heavy metals
- Mass excavation

- B.S. Landscape Architecture—Natural Resource Management, University of Wisconsin—Madison, 1991
- American Red Cross, Standard First Aid & Adult CPR
- Groundwater Sampling Training
- Confined Space Entry
- Transportation of Hazardous Materials Training
- 40-Hour OSHA HAZWOPER Training
- LPS (Loss Prevention System) Training
- Terra BASICS Training



Rick Folan—Senior Client Services Manager

Mr. Folan has over 26 years experience with environmental consulting and hazardous waste management. He has held various positions in his career ranging from Customer Service Representative to National Accounts Manager. Areas of concentration include RCRA regulations pertaining to hazardous waste storage, transportation and disposal. Later in his career, Mr. Folan was employed as a Business Development Manager specializing in asbestos abatement, remediation, industrial services and emergency response.

Expertise

- Marketing plans, budgets and forecasting
- Marketing of hazardous waste management services
- Management of corporate accounts
- RCRA regulations

Education and Specialized Training

 B.A. Business Administration, with Field of Concentration in Marketing and a minor in Economics, Baldwin Wallace College—Berea, Ohio



Howard Evans—Project Manager

Mr. Evans has over 25 years expenence in the construction industry with over 15 years expenence in the environmental industry. As a project manager, Mr. Evans has been involved with a broad array of complex environmental remediation and mining/earthwork projects. His experience includes slurry wall construction, SVE/AS system installation, groundwater pump & treatment closures, plant decommissionings, UST/AST decommissionings and mine reclamation. His responsibilities have involved the development of work plans, cost estimating and billing, project setup, health & safety compliance, project execution, cost control and tracking.

Expertise

- Project Manager of PCB-contaminated sediment remediation project in Noblesville, Indiana
- Project Manager on an in-place sediment capping project in Daytona Beach, Florida
- Project Manager and Key Operator for the closure of wastewater treatment ponds in Atlanta, Georgia
- Project Manager and Key Operator for the removal of oil-water separators in Casper, Wyoming
- Project Manager and Key Operator on a landfill cap restoration in northern Ohio
- Project Manager and Key Operator for the construction of a clay-cap and installation of a geochemical barner on a 60-acre contaminated cadmium smelter in Columbus, Ohio
- Project Manager for the stabilization of 7,000 cubic yards of resin and capping & closure of a pond in Eugene, Oregon
- Site Superintendent for the stabilization of treatment sludge and construction of a clay cap to close a lagoon in Tipton, Indiana

- 40-Hour & 8-Hour OSHA Health & Safety Certification
- OSHA Confined Space Training
- International Fire Code Institute UST Decommissioning Certificate
- Class B Drivers License
- CPR & First Aid Certificate



Robert Howe-Project Manager

Mr. Howe has over 20 years experience working in environmental remediation working on a variety of projects. He has experience as a heavy equipment operator, machinist, mechanic and project manager. Mr. Howe's broad background includes working as a project superintendent and safety officer on a Superfund cleanup of paint sludge, project superintendent of a mercury cleanup and water treatment operation, captain of a clam bucket dredge and excavator dredge, project superintendent of a coal tar cleanup, stabilization of impacted soils, pugmill operation and demolition experience

Expertise

- Project Superintendent & Safety Officer for Superfund paint sludge cleanup in Ringwood, NJ.
- Project Superintendent of an oil sludge solidification in Port Arthur, TX
- Project Superintendent of a mercury cleanup and water treatment operation in Syracuse, NY
- Captain/Project Superintendent of clam bucket dredge and excavator dredge overseeing a 4-man crew
- Project Superintendent of a lead-impacted soil stabilization project in Pedrictown, NJ
- Project Superintendent of a demolition of a fertilizer plant and excavation of contaminated soil with a crew of 40 employees in Salt Lake City, UT
- Project Superintendent of a demolition of a Uranium mill and capping of tailing ponds with a crew of 30 employees in Moab, UT
- Project Superintendent supervising a crew of 25 employees of a chemical sewer cleanup of a shale oil plant in Parachute, CO

- 40-Hour HAZWOPER Training
- CPR/First Aid Training
- 30-Hour OSHA Training
- Confined Space
- Defensive Driving
- CDL License
- Terra BASICS Training



Jtannar Wiens-Project Manager

Mr. Wiens has over 7 years expenence in environmental remediation and recently was promoted to Project Manager. His expenence in environmental remediation includes two years of Site Health and Safety Oversight. His responsibilities include site safety management and implementation of remedial technologies. Mr. Wiens is knowledgeable in the areas of hydrogeology, geology, environmental remote sensing, environmental surface geophysics, well drilling and installation, aquifer testing, remediation design and implementation, ground-water sampling and monitoring and air sampling and monitoring.

Expertise

- Soil and groundwater remediation
- Landfill capping and maintenance
- Facility dosures
- Facility and equipment documentation
- Above ground & underground storage tank removal
- Abandoned site cleanup/remediation
- Lagoon closure and cleanup
- Wetland construction
- River bank stabilization
- Emergency spill response
- Industrial cleaning, decontamination & pressure washing

- B.S. Hydrogeology, Western Michigan University, 2006
- OSHA 40-Hour HAZWOPER Training
- OSHA Confined Space
- OSHA Lead Awareness
- Asbestos Awareness
- LPS (Loss Prevention System) Training
- Terra BASICS Training





MGP Site Cleanup & Restoration

The Client:

Michigan-based Utility

The Job:

Removal of impacted soils & sediments, installation of a groundwater treatment system and reconstructing the City's storm sewer outfall & drainage swale

Parties Involved:

Michigan-based utility
State, County & City government
Engineering firm
Citizen Advisory Committee
Terra Contracting

Special Conditions:

Extremely confined construction area within an apartment complex and residential neighborhood

Time Frame: 4 Months

Equipment List Included:

Excavator (PC300)

Excavator (PC300 with long reach arm, 60'boomstick)

Crane (55 ton Kobelco)

Loader (L180)

Sky Trac

(List continued on page 2)

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace

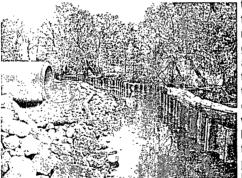


The primary objective of this project was the installation of steel, sealed-sheet piling to funnel impacted groundwater from a former manufactured gas plant facility to activated carbon treatment cells to treat the groundwater before discharging into a creek and, reconstructing the City's storm sewer outfall and drainage swale and replacing a foot bridge over the storm sewer outfall. In addition, a secondary objective involved the removal of impacted soils—along a creek bank within the confined boundaries of an apartment complex. The construction site occupied approximately 2 acres and contained a variety of waste residuals.

including coke, ash, gas plant residuals and demolition debris

Given the high visibility and close proximity the construction site was to a Senior residential apartment, careful steps were taken to communicate the scope of the project to all parties involved, including local media and surrounding neighbors, and what the benefits would be upon completion. Once the site was contained for erosion control, a 600' temporary road had to be constructed to allow truck traffic access to the site for the removal of the impacted soils. Next, approximately 550' of temporary sheeting along with a silt curtain were installed in the creek for containment. Extra measures were taken due to the fact that the creek was a designated trout stream by the State of Michigan. In addition, fire-suppression foam was used to control odors and an air-monitoring program was implemented to safeguard human health and the environment.

Before the excavation of materials could begin, the area needed to be dewatered. Due to the nature of the soils and residuals within the site, dewatering wells could not effectively prepare



the area Water was pumped from within small cofferdams and excavation cells approximately 700' into four, 20,000 gallon frac tanks. Over 800,000 gallons of water were removed during the project and hauled to a treatment & disposal facility. During the excavation of impacted soils, a pocket of coal tar was discovered outside the temporary sheet pile containment area within the creek. This tar was a weathered, hard tar with a thickness that ranged between 2" to 2'. Normally this material would have to be dredged out, which would have delayed the project weeks as a dredging permit would have to be obtained. Terra, however, was able to remove

this material using their own patented "Sed-Vac" process—a unique vacuuming process that can be used effectively as an alternative to standard dredging options

Basically, Terra's Sed-Vac process consists of vacuuming sediments from water using an industrial vacuum loader. The operation allows sediments, in this case the coal tar, to be removed from the affected area with very low turbidity. And even though the coal tar was extremely hard, which would have made dredging more difficult, Terra employed water-blasting technologies, with up to 10,000 psi to loosen the hardened tar for easy removal. Additional

benefits of the Sed-Vac process include quick set-up, the ability to work around underwater debris and it provides automatic separation of heavy solids. Tar was removed from approximately 100 lineal feet of the creek. The material removed was "landfill-ready" with no further treatment required before it was hauled to a local landfill.





MGP Site Cleanup & Restoration...contd.

Equipment List Included: (continued)

(3) Dewatering pumps Gravel trains

Water tankers (9000 gallons)

(4) 20,000 gallon frac tanks

Vibratory hammer (H1200)

(4) Pumps

Industrial vacuum loader

Rolloff truck

(2) vacuum boxes

10,000 psi water-blaster

Air compressor

Vibratory compactor

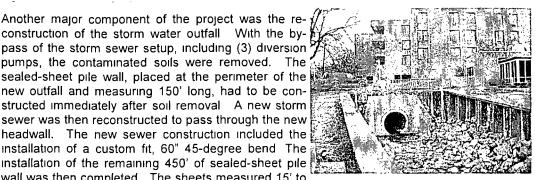
Crane mats

Stone box

Welding machines

Street sweeper

construction of the storm water outfall. With the bypass of the storm sewer setup, including (3) diversion pumps, the contaminated soils were removed. The sealed-sheet pile wall, placed at the perimeter of the new outfall and measuring 150' long, had to be constructed immediately after soil removal. A new storm sewer was then reconstructed to pass through the new headwall. The new sewer construction included the installation of a custom fit, 60" 45-degree bend. The installation of the remaining 450' of sealed-sheet pile wall was then completed The sheets measured 15' to were grouted for a complete seal.



30' in length and were driven 2' to 3' into the underlying bedrock. The joints of each sheet



A groundwater collection system was then constructed inside the sealed-sheet pile wall. The collection system consisted of a "French-drain" with an internal 6" perforated pipe. The drain system was connected to (3) underground carbon cells measuring 8' in diameter and 6' deep. Each cell contained 6,000 pounds of activated carbon. The groundwater entered the top

of each cell and was redirected to a diffusion system in the bottom of each cell. The hydraulic head would push the water up through the carbon placed over the diffusion system and outlet at the top of each cell, through the sealed-sheet pile wall and out to the creek. Currently 28,000 gallons of water are treated daily Next, site restoration began. The temporary road was removed and replaced with a permanent concrete roadway to the carbon cells and various sidewalks. The pedestrian bridge was replaced with a new, pre-engineered steel bridge that would carry the weight of service vehicles deployed to maintain the carbon cells.



In the end, the total amount of sheeting used was 11,175 sq. ft —the total amount of contaminated material removed was 6.068 tons and the total amount of backfill was 5,200 tons But more importantly, even with so much activity during construction in a confined area, Terra's Safety Plan achieved it's objective of no accidents Finally, all parties involved were very pleased with the results, especially the residents of the Senior apartment house, who presented the Site Manager from the Michigan-based utility a hand-written thank you note for a job well done

"This project again demonstrated Terra's ability to respond with ingenuity and sensitivity. Terra's ingenuity was demonstrated with their Sed-Vac process to effectively remove unexpected coal tar from the stream bed Terra's sensitivity was demonstrated by using appropri-

ate and effective construction methods within the confined work area to minimize odors, dust and vibrations. Upon project completion, a "thank you" card from one of the residents said it all on the success of the project "

- Site Manager for Michigan-based utility



Terra practices the Loss Prevention

System (LPS) - a behavior-based

safety program designed to improve

safety in the workplace





Tracking Terra

Removal of Contaminated Soil, UST's, Dock Tanks and Pipeline

The Client:

Two Engineering Firms Michigan DEQ

The Site:

Former fueling station docks on Lake Superior

The Job:

Remediate former fueling station on Lake Superior including removal of contaminated soil, storage tank and pipeline

Special Conditions:

On-site revision of strategy was required to meet challenging conditions contaminated soil was located within a few feet of Lake Superior, aging pipeline extending 250' into the water carried possible contaminants, precision work was required from a barge-mounted crane in choppy water

Time Frame: 2 Months

Equipment List Included:

PC 300 Excavator Hitachi 450 Excavator Komatsu 470 Loader Komatsu D41P Dozer 4" and 6" Godwin Pumps Portable screen for overburden 100 ton barge Crane 30' Barge

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace



The project involved clean-up of a former bulk oil base and fueling station once used for ships on Lake Superior in Michigan's Upper Peninsula Above ground fuel tanks had already been removed Terra's job was to remove and dispose of contaminated soil, remove underground tanks, as well as dock tanks and fuel lines that extended into Lake Superior

Removal of contaminated soil took place in an area that was defined on the

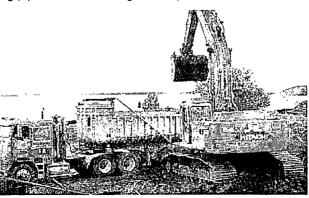
lake side by an earthen berm wall and sheet piling ending at approximately 8' from the water's edge. The soil was contaminated with Light Non-Aqueous Based Liquids (LNAPL's). The

depth of the contaminated soil required excavation to a depth of two inches below the water table. Terra installed pumps to de-water the area, then solidified solid waste using dry soil in preparation for removal.

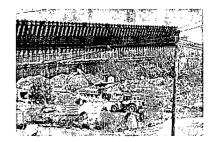
The more challenging aspect of the job was the removal of tanks and pipeline from the 250' docks that extended into the lake. The original specifications for the job called for cutting the pipeline into 50' sections and bringing them into shore for scrap. After studying the job, Terra project leaders grew con-

cerned about the quantity of fuel oil and other contaminants that might be contained in the aging pipeline since cutting could spill contaminants into the lake.





Terra proposed an alternate, safer approach, although it required highly skilled execution—to carefully lift and pull the pipeline up onto land and undertake the cutting operation over a decontamination pit.





Removal of Contaminated Soil, UST's, Dock Tanks and Pipeline...contd.



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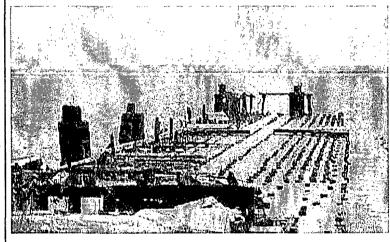
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First, the storage tanks at the end of the dock were removed Then Terra deploved a barge-mounted crane to angle the pipeline up using two lifting points, and lifted and pulled it carefully onto land where it could be cut. This was the risky part of the operation, since the barge was subject to waves on Lake Superior, and it was difficult to determine exactly how much integrity the pipes still had After a cut was made. the crane then angled the pipe again and lifted the next section onto the shore for the next cut. The barge



and crane work proceeded according to plan and the cutting was executed flawlessly. Not a single drop of material from the pipelines was released into the lake. The pipe sections were transported out for scrap.



The project was then completed with the backfill of excavation and land-scaping in time for a major summer event held in the area. The entire project was completed in two months and under budget. The land was subsequently developed into a resort condominium property.

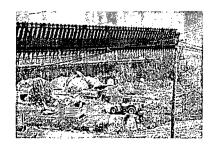
"It was a tense moment when it came time to lift the pipeline with the crane and the waves rocking the barge. But we executed perfectly. It was the most phenomenal job I've been involved in and I recall that the DEQ was ecstatic when we pulled the last of the pipe in without any spill."

-Rich Anson:

Project Manager

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace







Lead Contaminated Remediation Project in Lake Placid, Florida

The Client:

Georgia-based engineering firm Paper Manufacturer

The Job:

Remediation and stabilization of lead-contaminated soil near a paper plant in Lake Placid, FL

Special Conditions:

Site was located adjacent to an active railway which required special care around rail ties

Time Frame:

Equipment List Included:

- (2) PC200 Excavators
- (1) WA380 Loader
- (6) Rock Boxes
- (1) TL 130 Skid Steer
- (1) Compactor
- (1) D39 Dozer
- (1) Vactor

Terra was contracted to remediate soil contaminated with lead resulting from lead-based dyes once used in the printing industry before being banned. The affected area was approximately 600 feet long by 100 feet wide and varied in depth from 2-5 feet and was located behind a former paper plant adjacent to an active railway. The engineering plan determined that the safest and most economical approach to treating the contaminated area was to stabilize the soil in place, taking special care with soil in close proximity to railway ties.

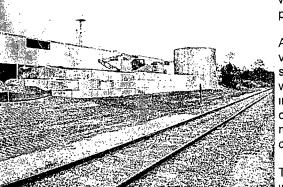
A five-man Terra crew went to work using two PC200 excavators. One excavator was used to stockpile contaminated soil while the

other was used to stabilize the soil by mixing it in batches with Portland cement. When the batches were completed, they were returned to the excavation where they were graded and compacted. As a precaution against possible erosion intensified by vibration from nearby rail lines, Terra constructed a Jersey wall consisting of 3' by 3' interlocking concrete blocks. The area was backfilled and capped with two feet of sand and then seeded and mulched

The area around the railroad ties provided a special challenge Terra crews had to coordinate their work

with railroad officials, ensuring that removed soil would be replaced by the end of the day to eliminate the risk of a possible train derailment. Terra determined that the best way to remove soil in proximity to the rail ties was to

ximity to the rail ties was to use a Vactor, replacing it with clean soil and ballast followed by compaction within a strict time frame



As Terra crews worked, the Florida DEP visited the site for inspection. An interesting side note to the project was that inspectors were armed with M-16's and side arms—not intended for Terra crews, of course, but because their other duties involved busting meth labs and overseeing the ensuing chemical cleanup.

The project went smoothly, with crews finshing on time and on budget. The client

was saved a significant additional expense. The State of Florida determined that the quality of work was so exceptional, it did not mandate the usual 2-year aftercare program, typical for such projects.

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace



Terra's performance on this project received the Governor's Award for Environmental Excellence by the Florida Department of Environmental Protection.





racking Terra

Contaminated Sediment Removal—Aberdeen, South Dakota

The Client:

Engineering Firm South Dakota-based utility

The Job:

Removal of oil contaminants from 2,000 ft of river bed in South Dakota

Special Conditions:

Tight time frame to complete before severe winter weather

Time Frame:

4 Months

Equipment List Included:

- (1) Long-reach excavator
- (2) Off-road trucks
- (1) D61 Dozer
- 6" and 8" Pumps



This project involved the removal of oil-based tar contaminants from the bed of Moccasin Creek in Aberdeen. South Dakota. The contamination was the result of ditch run-off from former oil refineries located along the creek

The target area involved about 2,000 ft of river at a width of about 150 ft. and a depth varying from 2 to 5 ft Terra began by driving sheet

pilings into the river bed at each end of the target area, then followed by setting up a storm water bypass and pumping system. After the target area was pumped dry, Terra crews built 1,200 ft. of access road and 1,400 ft of roads right into the river bed allowing haul trucks direct access to the contaminated area Using a long-reach excavator, operators loaded contaminated sedi-

ment into the trucks which was then taken to a 300' by 300' staging

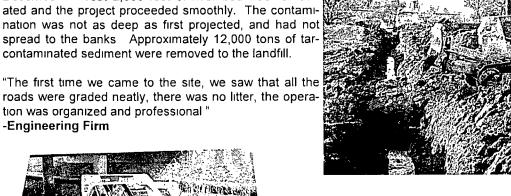
area where it was drained, then mixed with straw as a Solidified contaminated sediment was then hauled to a nearby landfill

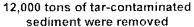
As part of the bypass operation, Terra set up a carbon plant to treat river water before returning it downstream. Solids were removed and the water was tested before releasing

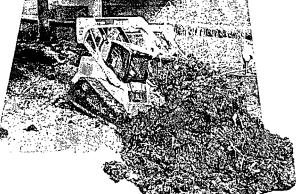
The project began in September and was completed in December About 2,000 feet of river bed was remediated and the project proceeded smoothly. The contamination was not as deep as first projected, and had not spread to the banks Approximately 12,000 tons of tar-

"The first time we came to the site, we saw that all the roads were graded neatly, there was no litter, the operation was organized and professional "

-Engineering Firm



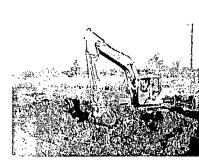




For more information, please go to www.terracontracting.net

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Demolition, Contaminated Soil & Drum Removal

The Client:

Environmental Engineering Firm Paper Manufacturer

The Job:

Remediation of former mill site, including paper sludge excavation and transport, building demolition and removal of contaminants

Special Conditions.

Contaminated area in proximity to river, unexpected presence of drums containing unknown substances, removal and disposal of 2,500 mercury light bulbs

Time Frame:

Equipment List Included:

- (1) Hitachi 450
- (1) PC300 Excavator
- (1) Hydraulic grapple
- (1) 10,000 class hammer
- (2) HM 400's
- (1) Komatsu WA 470 loader
- (3) D 61 Dozers
- (1) MTI Boom truck
- (1) D39 Dozer
- (2) D-65's
- (4) Support trucks
- (1) 55-gallon drum handler attached to a PC-300
- (1) MT 31
- (8) Trucks (gravel trains)
- (1) 800 chipper
- (1) 5325 Deere tractor
- (1) Water treatment carbon trailer
- (2) Generators
- (2) Genie pressure washers

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace



This project involved remediation at a former Michigan paper mill site located near the oxbow of a river. The job, which began in April of 2006, involved several components, including a refuse area, a transformer pad, the mill itself, as well as several smaller buildings. First, Terra crews cleared the area that had been used to dump paper sludge. Crews spent three months excavating 21,000 cu yd. of residuals and trucking them to a nearby landfill Crews then hauled in 11,000 yards of backfill into the remediated refuse area. Terra was instructed to form a 1,500 ft long depression along the top of the backfilled area in order to prevent water from flowing down to the river, and also to create a wetland environment. To fit the ecological scheme of the wetland, Terra planted appropriate shrubs and other plant life





The next phase of the job involved a former paper sludge refuse area adjacent to the nearby river. After a turbidity curtain was installed in the river, Terra crews excavated an area of approximately two acres to a depth of ten feet. During the excavation activities, approximately 50 buried drums containing unknown substances were encountered. The drums were removed, placed in overpack containers and moved to a temporary drum storage area. After the waste was properly characterized, the drums were shipped off-site to proper facilities for disposal. The excavated area was then backfilled, topsoil was installed, and the area was planted with grass seed and shrubs. In addition, the river banks were armored with rip-rap.

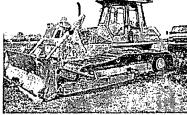
The remaining phases of the project involved the mill and other related buildings. Terra first remediated a transformer pad inside of the mill that contained a 42" pipe that had been used to drain to the river. A crew excavated a 45' X 45' X 6' area, removing 500 yards of dirt that had been contaminated by PCBs, oil and other substances. The soil was transported to a Class II landfill. A filter screen that had been used to catch tree limbs and other debris was also removed. Within the mill itself, a Terra crew excavated trenches, which were filled with paper sludge, surveyed the area, then decommissioned several pumps and approximately 400 motors. In addition, Terra collected 2,500 mercury light bulbs and disposed of 4,500 mercury switches.



A crew also remediated a cistern, 25' in diameter and 10' deep. After the cistern was cleaned, its discharge pipeline was plugged with concrete. Asbestos in adjacent metal buildings was tagged, bagged and removed before the buildings were demolished. In a nearby building used for filtering, crews pumped out 900,000 gallons of filtered water that had been held in the building and conducted an appropriate analysis. Finally, with the approval of the local city government, crews pumped the

water into the municipal sanitary sewer system

In March of 2007, the entire job was completed.





Tracking Terra

Landfill Cap Using GPS Technology

The Client: Engineering Firm Landfill Company

The Job:

Landfill consolidation and water management system upgrade

Special Conditions: Tributary to Lake Erie bisecting project site

Time Frame: 4 months

Equipment List Included:

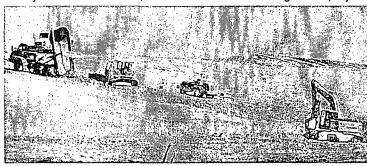
(10) Articulated dump trucks
(3) D39 Dozers
(2) D61 Dozers
GPS Guided bulldozers
D31 Dozer
JD650 Dozer
GPS Guided grader
600 Backhoe
PC600 Excavator
JD 650 Dozer
WA470 Loader
84" Roller
Water Truck

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace



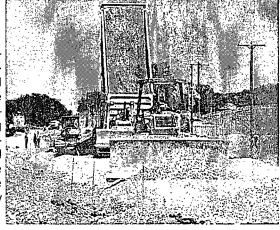
Terra was contracted to cap a 16-acre cell in one of the largest landfills in the state of Michigan Special circumstances created a tight time frame the cap needed to be completed before winter snows, and due to a variety of circumstances, Terra was unable to begin the project until September.

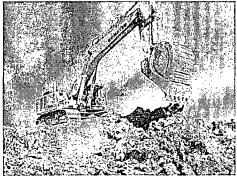
Terra teams began by grading the cell slope using a Global Positioning System (GPS). Both dozer and grader were guided by the GPS technology with Terra operators doing the steering, ensuring the most accurate grade possible.



The liner already in place, Terra crews went to work on a cap Ten articulated dump trucks were used to haul 50,000 yards of clay from a nearby borrow area. The team compacted the clay to a depth of 2 feet, then followed with 15,000 square yards of topsoil to a depth of 6 inches. Terra then went to work building the drainage system, building clay berms along the slope. A stoneway was constructed for each berm followed by construction of stone chutes and spillways.

Terra crews were forced to work in an extremely tight schedule because of the project's late start. A team of 16 put in six and seven-day workweeks to finish before the first winter snows. The team moved efficiently and professionally without taking shortcuts and demonstrated a key Terra principle intensity. The final step, seeding and mulching, took place in early December. The team finished just under the wire. Three days later, a major storm dropped 8" of snow onto the cap.





"Our guys are what made that job. They understood the sense of urgency, all pulled together and did a heck of a job."

-Tom Anoskey: Project Manager





Tracking Terra

Landfill Capping Project

The Client:

Paper Manufacturer State Government Engineering Firm

The Site:

Two landfills at former paper manufacturing facility

The Job:

Re-contour and stabilize landfills

Special Conditions:

Multiple changes in complexity and size, integration and coordination with a second project

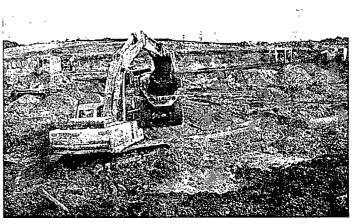
Time Frame: 18 Months

Equipment List Included:

- (2) Komatsu PC 300 Hydraulic excavators
- (2) Komatsu D61 Dozers
- (1) D41 Dozers
- (2) End Loaders
- (8) Off road trucks
- (6) Gravel trains
- (1) Office trailer
- (3) Dewatering pumps

The objective of the project was to re-contour and stabilize (2) existing landfills at a former paper manufacturing facility. Over several months, the job changed in complexity and size and became integrated with a parallel job, which delivered important efficiencies.

The landfill area comprised approximately 70 acres, with 45 acres devoted to two waste disposal facilities. The facilities had accumulated waste for decades, but the methods by which they had been previously managed did not meet current regulations for closure.





At project outset, a soil erosion and sedimentation control plan, (SESC), was put into place Erosion controls components included 8,000 lineal feet of silt fence, 500 lineal feet of silt curtain placed in the Kalamazoo River, temporary sedimentation basins and the creation of drainage channels throughout the site. At this point all vegetation was removed from the landfills, including large trees on a 1 1 slope

With new landfill footprints provided, Terra set about easing shear slopes into 3 1 slopes. Forty-thousand cubic yards of paper making residuals

were pulled away from the bank of the Kalamazoo River and spread about the facility to create gentler slopes

Terra constructed a new sediment pond large enough to accommodate most of the run-off from both landfills. A second sediment pond was subsequently added to attend to the far reaches of one of the landfills.

During the course of site closure operations, Terra, the site owner and the site engineer recognized an opportunity to clean-up another area of the closed facility for a very reasonable sum. Two large sediment lagoons existed adjacent to the work site. They were connected to the wastewater treatment operations at the facility. These lagoons contained >50,000 cubic yards of very unstable, saturated sediments.

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace





Landfill Capping Project...contd.



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To find out more about these companies, please visit

www.terra-companies.net

As it was, Terra was in the process of executing yet another large scale project in the vicinity of the landfill closure. This project involved the removal of approximately 212,500 cubic yards of coal ash from a former coal fired steam plant. The coal ash would provide a very economic stabilization media and allow for the clean-up of yet another site at an affordable cost

With the assistance of the Michigan Department of Environmental Quality, two municipalities, two environmental consulting firms and the two owners, Terra was able to clean-up two sites and restore them to the tax roles.





With the landfills now at their shape, slope and capacity (not withstanding the third set of drawings), Terra went about the final stages of capping the facilities. A 12" gas venting/grading layer was placed followed by the geo-synthetic liner. A 12" protective layer made of specified sand was placed directly on the liner. An additional 12" of bank run mixed with topsoil was placed as protective layer. The bank run mixed with topsoil allowed the use of compost for the vegetative layer. The compost was disked into the 'mix' material prior to the application of seed, fertilizer and mulch

"The Parchment project is a clear example of how industry can work hand in hand with the State and the Community to achieve a goal that benefits everyone. The cornerstone to a project like this is having a contractor like Terra that everyone respects and can have confidence in "

-Paper Manufacturer Executive

Landfill/Fly Ash Project By the Numbers:

- -54,087 trucking miles (all sand compost and gravel hauled into the site) more than twice the drive around the earth's equator
- -18,458 man hours on the job One person would have to work 9 25 years at the average 2000 hours per year

-233,168 yards of sand, almost enough to spread 2- 3/4" of sand over a square mile

-173,144 tons of protective soil and compost, the same amount of trash generated per year by Kalamazoo County citizens

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Fly Ash Excavation Project

The Client:

Michigan Based Utility State and City Government

The Job:

Removal and transporting of 7 1/2 acres of accumulated fly ash

Special Conditions:

Site located in active commercial district and along a river bank, seven acres of fly ash hills, some 25 feet in height, tremendous potential for dust, two engineering firms, two companies, two government organizations and multiple vendors involved in the project

Time Frame: 2 Months

Equipment List Included:

At Fly Ash Site:

- (1) PC300 Hydraulic Excavator
- (1) Volvo L-180 End loader
- (1) PC300 Hydraulic Excavator with rotating shear
- (1) Komatsu D37 Dozer
- (1) Komatsu D41P Dozer
- (1) JCB 212 Utility Tractor
- (1) 18" Self-Loading Chipper
- (1) 500 Horsepower Tub Grinder
- (1) 9 Sets of Gravel Trains
- (1) Water Truck
- (2) Street Sweeper

At Landfill:

- (2) Komatsu D61PX Dozers
- (1) Water Truck
- (1) Komatsu WA450 Loader
- (1) 54" Roller Compactor

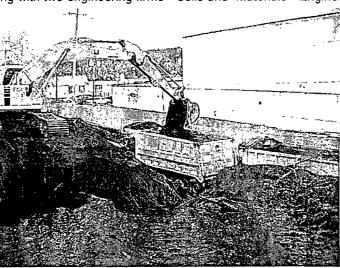
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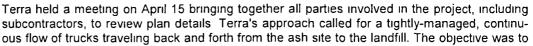
The objective was to remove accumulated fly ash from the site of a former coal-fired power plant, once operated by a Michigan based utility, in preparation for development. The site was located at the northeast edge of Kalamazoo's downtown area along the Kalamazoo River The ash had accumulated in the form of hills which covered 7 1/2 acres and reached 25' in height in places

The City of Kalamazoo had acquired the land for development, but concluded after analysis that the cost of removing the ash was prohibitive. The city then teamed up with the Michigan

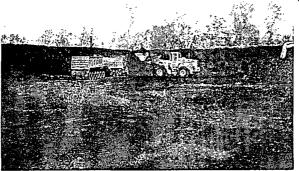
Department of Environmental Quality and a Michigan Based Utility to find a solution Working with two engineering firms—Soils and Materials Engineering (SME) and Blasland, Bouck



& Lee (BBL)—it was determined that the project was feasible if the ash could be transported to a nearby landfill. The former Crown Vantage paper mill, located in Parchment, Michigan, included a 40-acre landfill facility The facility required fill materials to contour the two landfills for closure purposes. Closure operations, funded by Georgia-Pacific Corporation and the State of Michigan, had been underway for approximately six months with Terra as the contractor. Now Terra was selected to implement the plan.



move 6,000 cubic yards, or about 120 truckloads per day, minimizing dust and noise that might affect the surrounding businesses.



For more information, please go to www terracontracting net





Fly Ash Excavation Project...contd.



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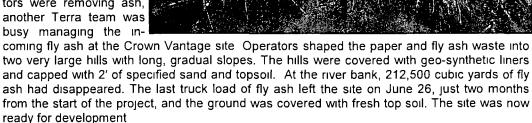
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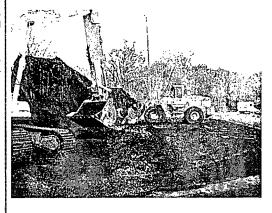
www.terra-companies.net

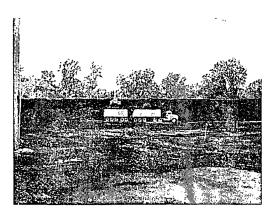
The site would first be cleared of 40+ year-old trees Terra crews cleared the site, chipped the trees and underbrush and used a large tub grinder to downsize all stumps. The wood chips would then be used for dust control throughout the project

While Terra operators and trucking subcontractors were removing ash, another Terra team was busy managing the in-



The entire project was completed ahead of schedule, and was delivered under budget





"The amount of coordination that was required to effectively execute this project was as impressive as I've ever seen. But most important was the fact that there were over 10,000 man hours worked without a single injury

-Steve Taplin:

Terra Contracting

"Excellent outcome on a difficult cooperative project with state and local governments and two major corporations to relocate 212,500 cubic yards of material for beneficial reuse in a very short time. On-site computers and communications with consultant was a big plus "

-Professional Engineer: Michigan-based utility



Terra practices the Loss Prevention System (LPS) - a behavior-based

safety program designed to improve



Tracking Terra

Excavation of Hazardous Material

The Client:

Chemical Manufacturer
Environmental Engineering
Firms

The Job:

Excavation of lead- contaminated soil from former chemical manufacturing site in southern Ohio

Special Conditions

Contaminated soil located on a steep hill in proximity to a river tributary, multiple contaminants in clay-based soil, prolonged rains created slippery and hazardous surfaces, soil volume was greater than estimated, confined work area

Time Frame: 6 months

Equipment List Included:

- (1) PC300 Hydraulic Excavator
- (1) Komatsu WA380 Front-End Loader
- (1) Cat 320 Excavator
- (1) Komatsu D41P Dozer
- (2) Off Road Trucks
- (1) Office Trailer Crane Mats

Tyvek Suits for Hazardous

Material Protection

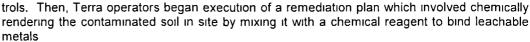
Full Face, Air Purifying Respirators (Level C), Chemical Resistant Coveralls, Boots and Gloves, Pressure Demand Supplied Air (Level B), Chemical Resistant Coveralls, Boots and Gloves

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The objective of this project was the excavation and removal of soil contaminated with lead, DDT, cyanides, and other chemicals from a former chemical manufacturing site in Marietta, Ohio The contaminated area included a steep hill which had served as dumping area for chemical waste and was within 100 yards of a creek that was a tributary to the Ohio River. The soil was clay-based, creating additional hazards when surfaces became slippery when exposed to moisture.

Before beginning excavation, Terra cleared the area of trees and instituted erosion con-



Because of hazards presented by the contaminants, all Terra personnel were 40-hour HAZ-WOPER certified Crews wore respirators and Tyvek suits which were changed a minimum of three times per day Operations executed on a day-to-day basis were conducted in "Level C"

protective gear, while application and mixing of the chemical agent were conducted in "Level B" equipment.

B C C set the p with t

Contaminated soil was dug out and placed in a separate excavation where it was mixed with the reagent in 100 cubic yard batches. Approximately five batches were mixed each day with crews averaging ten hours per day. Each batch involved pumping approximately 300 gallons of the viscous chemical reagent directly into the soil, resulting in a distinct chemical reaction as contaminants were stabilized.

The job was continually challenged by weather. Rain was heavy— during the course of the project, approximately three million gallons of water had to be pumped from the work site and into frac tanks for filtering and treatment before being hauled away. Excavation operations were conducted in a manner that allowed efficient management of surface water without allowing any migration out of the work zone. Once analysis revealed acceptable analytical results, the tested soil stockpiles were moved to a transportation staging area. When quantities were sufficient for mass trucking, an end loader loaded multiple trucks for transportation and disposal.

The project was competed when the area no longer tested positive for lead-contaminants The work was completed on time and on budget, without accidents.

"This was toxic soil and we were just a few steps away from a stream that fed to the Ohio River A lot of the work was on a steep hillside, and there was continuous rain. The job grew as we got into it, but we met every challenge I was proud of our guys— they took everything in stride and did a great job."

-Steve Taplin: Terra Contracting





Landfill Cell Construction

The Client:

Landfill Management Firm

The Job.

Excavation of new landfill cell, construction of barrier berm, mitigation of non-regulated wetland

Special Conditions:

Very tight budget Landfill mitigation involved severely unstable soils

Time Frame: 5 1/2 Months

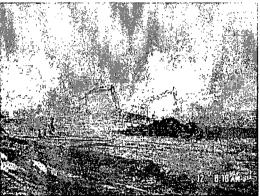
Equipment List Included:

- (7) MT 26 Off-Road Trucks
- (1) D41P Komatsu Bulldozer
- (1) D61 PX Dozer
- (1) Caterpillar 815B Compactor
- (1) Champion 740A Road Grader
- (1) PC 250 Long Stick Excavator
- (1) PC 300 Long Stick Excavator
- (1) EX 550 Excavator
- (1) 84" Sakaı Smooth Drum Roller
- (1) Water Truck
- (1) 6-Inch Pump
- (1) 3-Inch pump
- (12) Dewatering Wells
- (1) Office Trailer

The objective of this project was to dig a new landfill cell 142,000 cubic yards in volume, and to mitigate an unregulated wetland that was in the footprint of a future cell. Of the excavated soil, 90,000 cubic yards were to be used in building a barrier berm, and 35,000 cubic yards were to be used for the wetland backfill. On the barrier berm and wetland backfill, there was a compaction requirement of 93 percent maximum density to achieve a 10-7 permeability

Excavation of the new cell went smoothly.

Terra operators encountered pockets of wet, sandy soil, but they were able to maintain structural integrity of the excavation. The project proceeded in a timely fashion, on budget.



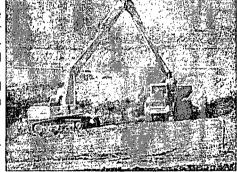
oject proceeded in a timely fashion, on budget. The cell was stabilized and sloped, and excavated soil was used to build a barrier berm that was compaction sealed.

As work proceeded on the unregulated wetland mitigation, Terra operators encountered extremely unstable soil in the form of supersaturated clay Terra installed twelve dewatering wells around the perimeter of the wetland excavation to depths of 85-95 feet. Once dewatering was completed, the area was excavated, operators removed a variety of soils, including 52,500 cubic yards of peat and marl which were separated, mounded and placed on site Then Terra proceeded to construct an unstable

soil bridge in the bottom of the excavation. The bridge consisted of a geo-synthetic grid fol-

lowed by two feet of compacted 21 AA limestone. The bridge was topped with a geo-textile prior to the application of the structural fill and a geo-textile layer consisting of Amoco 4553 filter fabric. Terra operators then backfilled the hole with 22 feet of structural fill topped with ten feet of re-compacted barrier clay. The wetland was finished with a one-foot sacrificial layer of soil, then sloped and graded, readied for a future cell.

All phases of the job were finished within the parameters of a very tight budget



"Terra was very professional and businesslike—I didn't have to hassle—them about the upkeep of project details like erosion control, and they—never interfered with the day-to-day business at the landfill."

-Landfill Manager

"The wetland excavation was a very challenging and rewarding experience Because of the intensity and competence of our operators, we were able to complete this job according to the schedule we had originally laid out"

-Don Hopper:

Project Manager

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace







Tracking Terra

8-Acre Cell Construction Project

The Client:

Public Landfill in North-Central Michigan

The Job:

Excavation and construction of an 8-acre cell

Special Conditions:

Excavation through various layers of clay to a depth of 45' - layer of high density, concrete-like layer required special tools, tight tolerances on finished grade, massive quantity of soil removal

Time Frame: 6 months

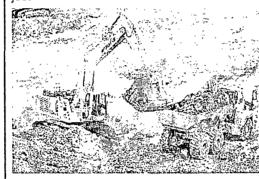
Equipment List Included:

Komatsu PC600 Excavator Hitachi EX550 Excavator Hitachi EX450 Excavator Moxy MT36 Off-Road Trucks Moxy MT31 Off-Road Trucks Moxy MT26 Off-Road Trucks Komatsu WA470 Loader Komatsu GD530 Grader Komatsu K65 Bulldozer Komatsu D61 Bulldozers 12' Offset Hydraulic Farm Disc Godwin 4" High Lift Pumps Topcon 2 Plane Lasers Caterpillar 815 Compactor Sakai 84" Smooth Drum Rollers Water Trucks

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace



The project involved excavation and construction of an 8-acre cell in a public landfill located in north-central The initial phase of the Michigan project involved the demolition of various structures on site, including a concrete slab containing post tension cables. This required an intensive and sustained effort using a pavement breaker. Terra team members then stripped topsoil to a 6" depth, stockpiling it on the work site for later use The construction of a haul road completed the first phase of the prolect

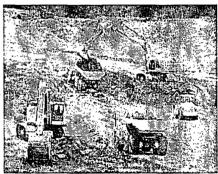


Terra began the excavation of the new cell with initial cuts reaching ten foot depths. Most of the soil was clay, so the excavation was sloped for positive drainage to a sump to prevent ponding of water.

The south end of the cell was sloped at a 4 1 ratio. The excavation continued through various layers of clay 15 feet of brown clay, through 20 feet of mottled clay, a layer of very moist blue clay, a thin layer of dense, low-permeability clay, and finally a bottom layer of unusually hard clay similar to concrete. Spe-

cialized teeth for the excavators, "Tiger teeth", were required to cut into the final layer of hardened clay so that the final grade could be completed. The cell bottom was located approximately 45 feet below initial grades, and approximately 315,000 cubic yards of soil were removed from the cell.

The north end of the cell contained silt and sand seams which presented potential avenues for groundwater. This portion of the cell was excavated and backfilled with lower permeability clay which had been stockpiled from previous work at the sound end of the site. The clay was moisture conditioned and then compacted in place, in 6" lifts, using a CAT 815 to a minimum depth of 12.5 feet to meet MDEQ requirements. Layers of GCL and 60 mil HDPE synthetic liner were put in place and Terra teams installed a leachate collection system utilizing perforated pipe with gravity drains to sump pumps and a forcemain.



The finished grading involved tight tolerances with high points from 0 0' to 0 2' and low points 0.0' to -0 2', made more challenging by the hardness of the clay. A laser and robotic total station were utilized to ensure that the grade

met tolerances





31-Acre Landfill Capping Project

The Client: Engineering Firm

The Job:

Close and cap former cement kiln dust landfill in southeastern Michigan

Special Conditions:

Accumulated CKD mounds with steep slopes, massive boulders of aggregated cement, grading and removing of kiln waste in proximity to a Great Lakes tributary

Time Frame: 8 Months

Equipment List Included:

- (2) PC300 Excavators
- (5) 25-Ton Off-Road Trucks
- (3) D65 Dozers
- (1) PC300 Equipped w/Hydraulic Shear
- (1) John Deere ZTS 50 Mini Excavator
- (1) 84" Compactor
- (1) Chipper
- (1) Office Trailer Crew Size 12

The project involved a former cement kiln dust (CKD) landfill adjacent to a guarry in southern Michigan The project had two phases Phase I involved re-contouring a 5-acre area of accumulated, hardened CKD in the Setting Lakes Area (SLA), Phase II involved closing and capping the 31-acre Southeast Disposal Area (SEDA) landfill Terra cleared and grubbed the 36-acre work area and installed soil erosion measures, including 10,000 feet of silt fence and drainage ditches at the slope's base

The first phase of the project was to re-grade the SLA, taking it from a 1 1 to a 3 1 slope. The work was challenging because of the steep grade and also because of large boulders of hardened concrete which were unearthed during

excavation, some of these boulders were the size of trucks and had to be broken up with a hydraulic hammer and hauled to the nearby SEDA for disposal. The SLA was successfully re-contoured to 3 1 slope by excavating at the top. Approximately 7,000 cubic yards of hardened CKD and soil were removed and the first phase of the project was completed on schedule

The second phase of the project involved capping and closing the landfill. The original project called for moving from north to south, but after analyzing the site. Terra project managers reversed the direction to prevent any possibility of affecting a stream that ran adjacent to

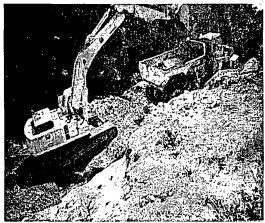
the southern end of the SEDA The dominant waste material was cement and kiln by-products including heavy metal salts and hi pH chemicals which had to be removed carefully - the adja-

cent stream was a Great Lakes Tributary

Once the SEDA was re-graded, the entire area was rolled, compacted and covered with a 1' grading layer. Terra then installed a seep collection system at the southern end of the site Next, subcontractors installed a geo-synthetic liner Following installation of the liner, Terra operators built a 5,000 ft drain system at the toe of the slope around the SEDA. They then installed 18" of protective cover soil over the liner. The cover soil came from an onsite source excavated from overburden soil in the future quarry. The process of using onsite cover soil and excavat-

ing a portion of overburdened guarry soil made for an efficient process and provided an extra benefit to the client. The cap was completed with 6" of topsoil and installation of storm water management features, including berms and down chutes.

Over the course of the entire project, Terra moved 350,000 yards of dirt. The job began in late May, and was completed in December, 2003 The project was on time and on budget, including approved change orders.





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MGP Site Cleanup & Restoration

The Client: Michigan-based utility

The Job:

Removal and replacement of contaminated soil

Special Conditions:

Unexpected hazardous waste and storage tank, intense fumes, proximity to river and public buildings Work was coordinated with three separate engineering firms

Time Frame: 1 month

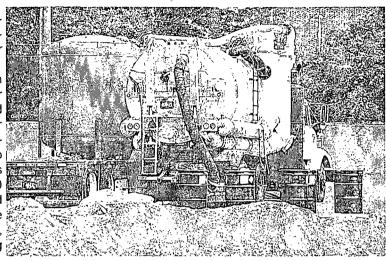
Equipment List Included:

- (1) PC 300 Excavator
- (1) PC 200 Excavator equipped with hydraulic breaker
- (1) PC 200 Excavator equipped with rotating barrel grapple
- (1) D41P Dozer
- (1) WA450 Endloader
- (1) 54" Vibratory Roller
- (1) Hydro-Mulcher
- (1) Back-up Hydro-Mulcher
- (1) 20,000 lb Air Activated Carbon System
- (1) High Intensity Industrial Vacuum Truck
- (2) 20,000 Gallon Frac Tanks
- (2) 45' Van Body Trailers
- (1) Vacuum Tanker
- (1) Transport Tanker
- (8) Sets Gravel Trains
- (1) Street Sweeper (1) Office Trailer
- Air Monitoring Equipment

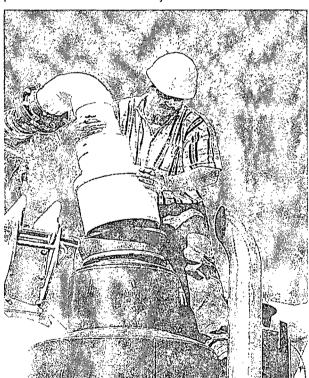
Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace



The original project objective was to remove contaminated soil at a former coal gasification facility Originally constructed in 1870 and modified over the years, the site had finally been paved over and used as a public parking lot. Working with two engineering firms. Terra's task was to remove 8.500 tons of soil, backfill and compact clean fill, replace drainage structures/piping. install an asphalt parking lot, a concrete parking lot,



curb, gutter, and sidewalks, and landscape a 'green strip'. The entire project was to be completed within 30 calendar days



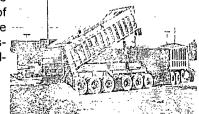
Initial soil samples taken as part of the site investigation plan indicated that chemical constituents of a health and safety concern were present Terra engaged a third consultant to assist in health and safety plan creation/implementation and provide technical assistance in waste handling and management.

During excavation, odors began to fill the air. As part of a comprehensive operational plan, Terra used a hydromulcher that broadcast a paper mulch to knock down the odors and seal up surrounding soil

Throughout the excavation, the crews unearthed remnants of the old building structures Pockets of water trapped by the debris were pumped from the excavation and containerized for waste characterization and later transport and disposal.

As excavation continued, Terra uncovered an underground, concrete vessel. The vessel contained flowable liquids and a large amount of heavy, tar-like

sludges. The liquids and sludge contained high levels of volatile and semi-volatile organic compounds. Although the liquids were quickly removed, stored, characterized and disposed of the sludges presented several operational challenges.





TRAGKING TRARKA

MGP Site Cleanup & Restoration...contd



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Ultimately, the sludge was vacuumed from the vessel and put into 55-gallon drums. An excavator was outfitted with a vacuum line to preclude vessel entry. The vacuum truck was set up with an activated carbon filter system on its pump exhaust to eliminate fugitive emissions. Five thousand gallons of sludge were packaged in drums and shipped off site for disposal at a fuels blending facility. Approximately 4,700 gallons of liquid were shipped to the same facility.

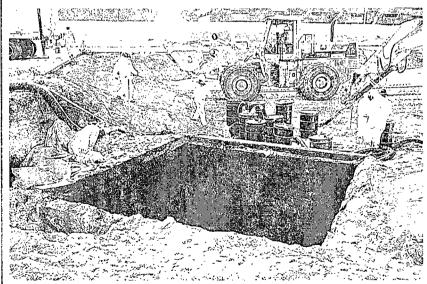
Once the excavation was complete, the entire area was backfilled. All in all, approximately 13,000 tons of soil, 9,940 gallons of contaminated water, and 91 drums of sludge were removed. The original deadline was met in spite of the job's unforeseen complexity. While the cost of the project increased, it fell within revised estimates

"This was a classic case of a job growing in complexity as we worked to complete it. It was a test of our reserves, our capacity for thinking on our feet and the ability to pull together a network of suppliers that could quickly assist."

-Steve Taplin:

Terra Contracting





"The scale and nature of this job changed quickly when Terra found hazardous substances. Working in proximity to several large public buildings, keeping odors down, and executing swift and safe waste removal and transport became a major challenge and it was all unfolding under an ever tighter project

completion date. Terra was up to it "
-Professional Engineer:

Michigan-based utility

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace





MGP Site Cleanup & Restoration

The Client:

Michigan-based utility

The Site:

Former manufactured gas manufacturing plan in eastern Michigan

The Job:

Removal and replacement of approximately 18,000 yards of coal-tar-contaminated soil

Special Conditions:

Power poles, two sewer lines, buried debris, contaminated groundwater

Time Frame:

Equipment List Included:

Excavator with hammer Excavator End loader Gravel Trains Dozer Vibratory compactor Tankers

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The location was a former manufactured gas site about ten acres in size, now serving as one of the utility's service centers. The plant had been demolished long ago, and an old foundation and piping was left behind. Excavation required working around live power lines and two storm sewer lines one active, one inactive

During the bid phase, Terra developed a unique strategy for dealing with the power poles. With power lines running on a north-south axis through the area to be excavated, the conventional solution was to take down the lines, dig out the power poles, excavate and replace.

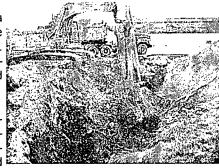


Terra devised a novel method for getting the job done safely using a far less time-consuming and less costly approach. Poles were removed one at a time, and upon completion of excavation, the previous pole was moved up to replace the one removed. This "leap frog" approach prevented the need to tear down poles and replace them with all new structures. Only one new pole was required to initiate the "leapfrog" process. Terra excavators also had to deal with two storm sewers which ran through the contaminated area. One was an older, inactive sewer, the other was active. Terra dug up and removed the older pipe line, sealed off the active

sewer, excavated all contaminated soil, then replaced pipe.

The contaminated area involved 24,000 tons of dirt at a depth of 14 feet. Debris from earlier demolition of the plant included sections of concrete up to 3 feet thick. During removal, Terra discovered pockets of contaminated groundwater which was pumped into tankers and transported to an appropriate site.

All in all, 18,000 yards of contaminated soil were removed and transported to a disposal site, and replaced with new soil. The entire job, including additional tasks, such as reagent-stabilization of tar and installation of new sewer lines, took about 35 days to finish and was completed within budget



"This job went very smoothly and with perfect safety—What made it unique was our concept for handling the excavation without having to tear down and replace all the power poles—Our client estimated we saved several thousand dollars with our 'leapfrog' concept."

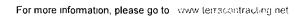
-Steve Taplin:

Terra Contracting

"One reason we picked Terra was because they are very customer focused and deliver on what they say they will do. As the job progressed, we added several work order changes Terra responded quickly with the appropriate people and equipment "

-Professional Engineer:

Michigan-based utility





Landfill Consolidation on Lake Erie

The Client: Engineering Firm

The Job:

Landfill consolidation and water management system upgrade

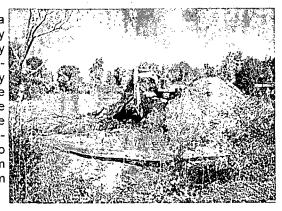
Special Conditions: Tributary to Lake Erie bisecting project site

Time Frame: 4 Months

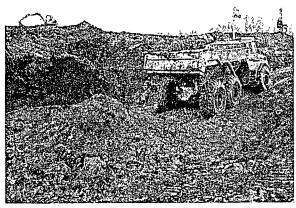
Equipment List Included:

- (3) Hydraulic Excavators
- (4) Off-road trucks
- (2) D5 & D6 Bulldozers Hydraulic shear 84" Vibratory compactor

The site was an 11.5 acre landfill used by a rayon yarn manufacturer for the disposal of fly ash and miscellaneous plant debris. The fly ash had been disposed as a slurry over a period of more than thirty years into two naturally occurring depressions near the plant. The objective of the project was to consolidate the two fill areas by relocating waste from the northern area into the southern area, thus reducing the overall landfill footprint, and also to upgrade a storm water management system to eliminate point source discharges of storm water



After wetlands in the landfill were identified and demarcated, Terra put in erosion controls, installing a silt fence around the area. The landfill was then cleared and grubbed. Trees were chipped and stumps were excavated and placed within the fill area. Terra operators then began to excavate and transport the accumulated fly ash waste, which had built up to a thickness of 17-23 feet.



During excavation. Terra used pumps to remove ground water and added drier ash to stabilize high liquid-content ash slurry Appropriate precautions were taken to minimize potential impact to a creek which bisected the fly ash disposal areas. Existing fly ash adjacent to the stream was used as a berm. Excavation proceeded in layers beginning at a distance and working toward the creek in a north to south direction so that natural drainage was maintained away from the creek Materials adjacent to the creek were not disturbed until the fly ash elevation in the adjacent area had been reduced so as to maintain the berm. This reduced the pos-

sibility of ash falling into the creek and direct run-off of surface water into the creek from work areas

After the northern and southern fill areas were consolidated into a single southern fill area, waste was compacted and re-graded to provide sheet flow of storm water either to perimeter wetlands or to the stream. Terra then installed a 24-inch cover system to prevent direct contact of the landfill materials with precipitation and to establish an adequate base for re-vegetation.

Mid-slope swales were put into place to direct storm water to the perimeter of the landfill and check dams were installed at the base of the landfill to minimize erosion and to eliminate point source discharges of storm water across the property boundaries. The cover soil was seeded/vegetated to assure adequate coverage of the landfill materials. Terra operators ultimately excavated, transported, placed and compacted approximately 80,000 cubic yards of fly ash. The project was completed on time, within budget, and without accidents.

Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace





Tracking Terra

Repair & Maintenance of Landfill Gas Management System

The Client:

Michigan-based engineering firm Michigan DEQ

The Job:

Repair and maintenance of a closed State-owned Class II landfill

Special Conditions:

Terra had to make on-site decision to simplify, shorten, and improve the repair strategy. The challenge was to give the pipeline a more streamlined design, and a more permanent, easier-to-maintain drainage system.

Time Frame: 2 Months

Equipment List Included:

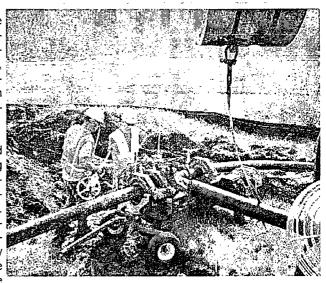
PC300 Excavator JD 50 Excavator Volvo L-180 Endloader Komatsu D41P Dozer 2 Compactors HDPE Welding equipment Grader laser Brush hog & chain saws

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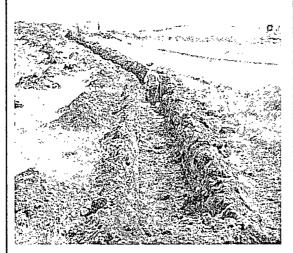


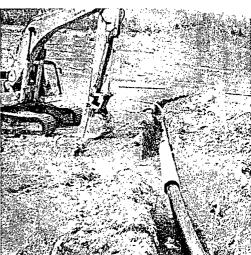
As Phase I of a two-year maintenance contract, this project involved modification of a landfill gas (LFG) management system, including site repairs, improvements and ongoing maintenance of the gas management system in a closed, Class II landfill in Waterford, Michigan

Continued settling in the landfill had stressed existing pipeline, creating narrow points in the lines where condensed vapor had accumulated, preventing free movement of landfill gas. Part of the original plan called for removal and replacement of the old system, but once Terra began work, they made modifications to simplify the approach. Terra left portions of the



original pipeline system in place, bypassing critical areas with new lines. The design of the new pipeline was simplified in the field to eliminate elbows and potential choke points, and to make installation more efficient. Once installed, the new line was connected to the functioning older line using "Y" connections. Terra also evaluated gas wellheads, replacing deteriorated heads with approximately 30 new vertical head assemblies.





Another dimension of the job was to repair the landfill cover system to promote surface-water runoff. Settling of the landfill had formed depressed areas that lead to ponding, and perimeter channels around the landfill base had deteriorated from erosion. Terra brought the landfill up to grade using a field grade laser, then performed ditch work to facilitate draining. The original plan called for filling in trenches, but Terra took the approach was

of building a spillway with three drain points and then installed a culvert to serve as a fourth drain point to create a more permanent and efficient drainage system.



For more information, please go to www terracontracting net



TRACKING TERRA

Repair & Maintenance of Landfill Gas Management System...contd.

Additional work involved fence repair, inspection and the repair of existing leachate collection system manholes. Ongoing maintenance responsibilities include site inspection, routine equipment maintenance, monitoring of flare station equipment, gas monitoring wells and other activities.



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Terra Contracting provides environmental remediation services nationwide

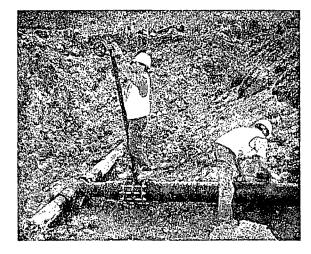
Terra I/S provides industrial cleaning services, hazardous waste services and emergency spill response

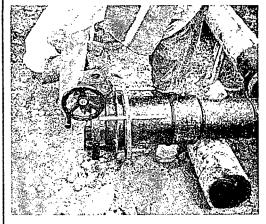
Terra Abatement Services provides asbestos , lead and mold removal and disposal services

Downunder Municipal Services provides sewer cleaning & maintenance services

To find out more about these companies, please visit

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The first phase of the project involved 50 acres and was completed in 37 days—well ahead of schedule and on budget

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TRACKING TERKA

Storm Sewer Removal Project

The Client:

Michigan-based utility

The Site:

Former manufactured gas plant

The Job:

Removal of storm sewer, replacement of manhole

Special Conditions:

Groundwater complications, proximity of high voltage power lines, water main, sanitary sewer, telephone and cable lines

Time Frame: 2 Months

Equipment List Included:

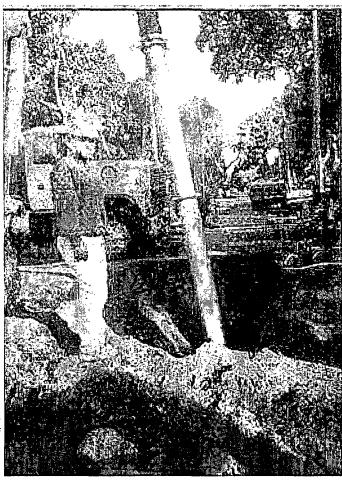
- (1) PC 300 Excavator
- (1) 2 1/2 Yard Loader
- (1) JCB212 Utility Tractor
- (1) 54" Vibratory Roller
- (1) "Vactor" Vacuum Excavation
 Machine
- (3) 20,000 Gallon Frac Tanks
- (1) Groundwater Dewatering System
- (2) By-Pass Pumps

This project involved the removal of a 36" glazed tongue-and-groove, brick storm sewer that was contaminated with and surrounded by coal tar residuals from a former manufactured gas plant. The pipeline was 180' in length and occupied a former creek bed, with one end running next to an active natural gas regulator station. In addition, all other utilities — 4,800 volt underground electric, 6" water main, sanitary sewer, telephone and cable - were within the project area and had to be dealt with. Instead of digging, Terra used vacuum excavation techniques to avoid disturbing infrastructure.

The 6" water main had to be rerouted to allow for the placement of a new manhole. Water service was disrupted while Terra crew members shut off, removed and relocated the water main. The Terra crew worked closely with the local municipality through all phases of the water main rerouting, including the chlorination of the new pipeline.

Another challenge to the project was the site's location in a residential area. Work hours were restricted and all operations had to be conducted with the residents in mind

The project presented a particular challenge due to the pipeline lying in a former creek bed. The local geology consisted of sand and gravel at the surface with sandstone at approximately 8'. The creek bed, which traversed the east side of the city, was a conduit for groundwater to reach the local tributary to the Kalamazoo River. Immense quantities of groundwater had to be pumped from the site in order to complete the project.



Dewatering required 24/7 pumping—to avoid disturbing the surrounding residential area, Terra operators surrounded the pumps with straw bales to dampen sound. Then, the final phase of the project could be undertaken connecting the new pipe to the existing pipe at the upstream end of the project area. Terra used 20,000 psi water blasters to custom fit the concrete manholes to the aged, upstream pipeline.

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TRACKING TERKA

Storm Sewer Removal Project...contd.



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But more challenges lay ahead On a sunny day and without notice, the project area was inundated with tens of thousands of gallons of water from hydrant flushing activities by the local municipality. The water breached the controls in place and flooded the work area Quickly, the crew isolated the work area from the downstream storm sewer and began pumping the water to the site frac tank. As a precaution, absorbent booms were placed at the outfall to capture any floating hydro-carbons. Additional frac tanks were delivered to the site as well as 10,000 gallon transport tankers. Within 2 hours a transportation and disposal operation was in full swing to manage the now-contaminated water.

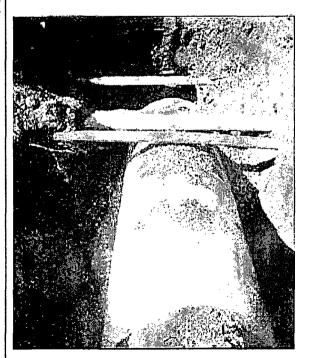
Due to the local geology it was anticipated that 40,000 gallons of water might have to be dealt with throughout project execution. In the end 232,150 gallons of contaminated water were removed from the site. In addition, Terra installed a small dewatering system that pumped hundreds of thousands of gallons from the former creek bed into the storm sewer.

In the end, 4,666 tons of contaminated soil and debris were removed from the site. The project ran over on time due to groundwater complications. The original project was kept on budget. The groundwater problem and the inadvertent hydrant flushing caused significant cost over-runs.

"The project had an unusual series of challenges within a very limited working area. Terra was responsive to the issues with innovation and persistence to complete the project to the satisfaction of all stakeholders."

-Professional Engineer:

Michigan-based utility



For more information, please go to www terracontracting net





Terra Contracting, L.L.C.

Incorporated in the State of Michigan

State of Michigan Certificate of Awardability

Sponsor-Sediment Management Workgroup

Member—Michigan Electric & Gas Association (MEGA)

Registered USDOT Fleet number

Adherence to USDOT and MDOT regulations

Member—Kalamazoo County Regional Chamber of Commerce

Random drug testing program

Field personnel training includes:

Licensed LPS Contractor—Loss Prevention System Safety Training

40-Hour Hazwoper

CPR and First Aid

(MSHA) - Mine Safety Training Course

Terra Contracting BASICS Training Modules

Terra—General Contracting Status:

- General Contracting Licensing Requirements Met
- O General Contractor's License Pending





Terra practices the Loss Prevention System (LPS) - a behavior-based safety program designed to improve safety in the workplace.



The foundation on which Terra Contracting was built is the diverse knowledge of its core personnel combined with a commitment to maintain the highest level of integrity throughout all operations.

The talents and experience of Terra's personnel range from civil projects to environmental remediation, from industrial cleaning to water management/disposal.

Every Terra client benefits from this breadth of knowledge and skill.

Corporate Office: Georgia Office:

5787 Stadium Drive 650 Fairburn Dr. SW

Kalamazoo, MI 49009 Atlanta, GA 30331

Ph. (269) 375-9595 Ph. (866) 354-8963

Fax: (269) 375-2830 Fax (866) 473-2996

Other Terra Companies:

Terra I/S

Terra I/S, LLC

Industrial cleaning, hazardous waste removal, transportation disposal services and emergency

spill response



Terra Abatement Services, LLC Asbestos, lead and mold removal and disposal services



Downunder Municipal Services, LLC

Municipal sewer cleaning & maintenance



KAR Laboratories, Inc.

KAR Bioanalytical, Inc.

STATEMENT OF QUALIFICATIONS

February 1, 2009

KAR Laboratories, Inc.
4425 Manchester Road
Kalamazoo, MI 49001
269-381-9666
Fax: 269-381-9698
email: info@karlabs.com
http://www.karlabs.com
http://www.karbio.com

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- 5. STAFF CURRICULUM VITAE
- 6. FACILITIES & MAJOR EQUIPMENT
- 7. CAPABILITIES, METHODS & STANDARD OPERATING PROCEDURES

1. A BRIEF PROFILE OF KAR LABORATORIES

The KAR Laboratory was established in 1956 in Kalamazoo, Michigan, in response to a need for a variety of laboratory services not available to area companies. The firm became incorporated in 1983 under the name of KAR Laboratories, Inc. as part of an expansion of services emphasizing the environmental demands in today's society. Through the years many changes have occurred as services were developed, expanded, or modified to meet the needs of clients. Early work emphasized industrial formulations, quality control, forensic investigations and agricultural chemicals. Later, clinical analyses became an important area of service. Starting in the mid 1970's, environmental analyses began to be required by many clients. This began a shift of services that continued throughout the 1980's culminating in KAR Laboratories, Inc. becoming a full-service environmental testing laboratory. Drug research and pharmaceuticals testing was first offered in 1999 and became separately incorporated in 2007 as KAR Bioanalytical, Inc., occupying approximately 4000 sq. ft..

KAR Laboratories is proud to continue building on a solid reputation for cooperation and reliable analytical testing. The firm has served clients in many states and several foreign countries, but primarily serves southern Michigan. Services have been provided to all types of industry, municipalities, consultants and commercial establishments as well as to individuals and regulatory agencies. The company will consider any project, but undertake only those where a beneficial service can be rendered to KAR's client.

KAR Laboratories offers a wide range of analytical services. KAR also assists clients with interpreting data, developing potential solutions to problems, and selecting the best solution to a problem. Consultation or development services are available on an individual basis. KAR Laboratories' sole business is to provide service to fulfill the needs of its clients.

2. CERTIFICATIONS, LICENSES, AND CERTIFICATES

U.S. Environmental Protection Agency (Lab No. MI00041), Michigan Department of Environmental Quality (Lab No. 0047), Indiana State Department of Health (Lab No. C-MI-04), expires 9/15/2009 for the following:

- Biological Examination
- Total Trihalomethanes
- Regulated and Unregulated Volatile Organic Chemicals
- Regulated and Unregulated Synthetic Organic Chemicals
- Regulated and Unregulated Inorganic Chemicals

U.S. Army Corps of Engineers Validated (LAPSED - expired January 11, 2003) for:

- Anions in water
- Cyanide in water & solids
- Oil & Grease in water
- Organochlorine Pesticides in water & solids
- PCB's in water & solids
- Semivolatile Organics in water & solids
- TAL Metals in water & solids
- TPH DRO/GRO in water & solids
- TRPH in water
- Volatile Organics in water & solids

Certificates & Registrations

- FDA Registration Number 18187500
- DEA Registration Number RK0260529
- OECD compliant (Organization for Economic Co-operation and Development)
- U.S. DEA Controlled Substance Registration Certificate for Schedule 2,3,3N,4, and 5 substances
- Controlled Substance License, State of Michigan, Board of Pharmacy



Social Medican DEPARTMENT OF ENVIRONMENTAL QUALITY LYSING



December 5 2006

CERTIFIED MAIL

Mr. William G. Rauch KAR Laboratories. Inc. 4425 Manchester Kalamazoo, MI 49001

Laboratory No: 0047

Dear Mr. Rauch.

SUBJECT Laboratory Certification

The information that was prepared and submitted to this office by your laboratory has been reviewed. Based on this information, the Department of Environmental Quality (DEQ) has certified your laboratory for compliance monitoring under the Safe Drinking Water Act, 1976 PA 399, as amended. Our certification for your laboratory by parameter is as follows.

Microbiology Full Certification

Total Coliform and E.coli (via Standard Methods 19th Edition, Method 9223B and m-CcliBlue24®)
Total Coliform (via Standard Methods, 19th Edition, Method 9222B)
E.col: (via Standard Methods, 19th Edition, Method 9221F)
Heterotrophic Plate Count (via Standard Methods, 19th Edition, Method 9215B)

Inorganic Chemistry

Full Certification

Barium, Cadmium, Chromium, Copper, Nickel and Sodium (via U.S. EPA Method 200.7)
Antimony, Arsenic Barium, Beryllium, Cadmium, Chromium, Copper, Lead Nickel, Selenium and Thallium (via U.S. EPA Method 200.8)
Mercury (via EPA Method 245.2)
Fluoride, Bromide and Sulfate (via U.S. EPA Method 300.0)
Nitrate and Nitrite (via U.S. EPA Method 353.2)
Cyanide (via Standard Methods, 19th Edition, Method 4500-CNIC, Eland G)
Total Organic Carbon (TOC) (via Standard Methods, 19th Edition, Method 5310C)

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Mr William G. Rauch KAR Laboratories, Inc. Page 2 December 5, 2006

Organic Chemistry Full Certification

(via U.S., EPA Method 525.2)

Etnylene Dibromide (EDB) and Dibromochloropropane (DBCP) (via U.S. EPA Method 504.1)

2,4-D, 2,4,5-TP, Dalapon, Dicamba, Dinoseb, Pentachlorophenol and Pictoram (via U.S. Method EPA 515.1)

Regulated and Unregulated Volatile Organic Chemicals and Total Trihalomethanes (via U.S. EPA Method 524.2)

Alachlor, Alorin Benzo(a)pyrene, Butachlor Chlordane, Dielorin, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl)phthalate, Endrin, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Metolachlor, Methoxychlor Metribuzin, PCBs (screen only), Propachlor, Simazine and Toxaphene

Our certification of the KAR Laboratories, Inc. Laboratory for the microbiological and chemical examination of drinking water is contingent on your continued compliance with state and federal regulations. Additionally, your certification is contingent on the submission of acceptable performance evaluation sample results from a state-approved supplier on a running 12-month basis.

Our certification of your facility will expire on November 15, 2009. At your option, you may display the enclosed certificates

If you have questions regarding this information, please contact me, at 517-335-8812

Sincerely

George L Krisztiam

Laboratory Certification Officer Laboratory Services Section

Environmental Science and Services Division

gk/mb

Enclosures

cc DEQ WD Kalamazoo District Office Kalamazoo County Health Department

State of Michigan Department of Environmental Quality Environmental Science and Services Division



CERTIFIES:

KAR LABORATORIES, INC.

HAS BEEN EVALUATED AND IS APPROVED FOR THE FOLLOWING PARAMETERS FOR THE ANALYSIS OF DRINKING WATER:

FULL CERTIFICATION INORGANIC CHEMISTRY

Brounde, Finaride, Norwe, Nurvie, and Sulfiete
Ant mony, Arsenie, Berginum, Channum, Chromium, Copper, Nickel, Selenium, Sodjum, and Thalium
Mercury
Lead
Fotal Organic Cerboi
Cyanide

This certification requires maintenance of an acceptable quality assurance program, use of approved methodology and equipment, and satisfactory performance on evaluation samples.

This certification does not guarantee validity of data generated.

November 15, 2009 Expraise Date

December 5 2006

0047

100 211 (2003) A control over 199, PA 1995

State of Michigan Department of Environmental Quality Environmental Science and Services Division



CERTIFIES:

KAR LABORATORIES, INC.

HAS BEEN EVALUATED AND IS APPROVED FOR THE FOLLOWING PARAMETERS FOR THE ANALYSIS OF DRINKING WATER:

FULL CERTIFICATION

ORGANIC CHEMISTRY

Regulated and Utregulated Violante Organic Chemicals and Tena! I inholomethrates
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Chlordanc, Pt.Bs, and Foxopheric
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Aldrin, Alachlor, Benzo(a)pyrene Burachlor, Di(2 ethylhexylladipate,

Di(2-ethylhexyl)philialate Dieldrin, Fadrin Heptechlor, Heptechlor, Epocide, Hexachlorobenzent, Hexachlorocyclopentadiene, Lindane Metalsiehior, Methoxychlor, Metribudin, Propachlor, and Santazine

This certification requires maintenance of an acceptable quality assurance program, use of approved methodology and equipment, and satisfactory performance on evaluation samples.

This certification does not guarantee validity of data generated.

November 15, 2009 Experimen Date

December 5, 2006

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0047 Laboratory Number

> 100 DE 100 500 - 40 NO FA 60 A

State of Michigan Department of Environmental Quality Environmental Science and Services Division



CERTIFIES:

KAR LABORATORIES, INC.

HAS BEEN EVALUATED AND IS APPROVED FOR THE FOLLOWING PARAMETERS FOR THE ANALYSIS OF DRINKING WATER:

FULL CERTIFICATION MICROBIOLOGY

Foral Coliforn and E.goli Hererotrophic Plate Count

This certification requires maintenance of an acceptable quality assurance program, use of approved methodology and equipment, and satisfactory performance on evaluation samples.

This certification does not guarantee validity of data generated.

November 15, 2009

Expira on Date

December 5, 2006

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0047 Lateratory Number

> 1106 27-032342 Auren 1 - N. Ter PA 376

Mirchell E. Daniels, Jr.

guaith A. Montae, M.O. sistema Over a guerre



CERTIFIED MAIL NO. 7003 0500 0000 1424 4538 RETURN RECEIPT REQUESTED

January 5, 2007

Witham G. Ra, ch. KAR Laboratories, Inc. 4425 Manchester Road Kalimazoo Michigan 19001

Dear Mr. Rauch

The Chemistry Laboratory (ISDR Laboratories, Indiguia State Department of Pearth, and reviewed your request to become a certified laboratory for chemical analyses of dricking water in the state of Indiana, pursuant to the requirements under the Safe Drinking Witter Act (SDWA) 42 U.S.C. 3000 ecsec, the National Primary Drinking Water Regulations (NPDWR) 40 CFR 141 and 142, and the Indiana Primary Drinking Water Regulations (IPDWR) 327 IAC 8-2. Your submittal package contained contribution information for the state of Michigan and copies of reports of the earlysis of water supply (WS) performance evaluation (PE) samples from a Michagan toproved proficiency testing program.

Based on Indiana's policy of approving laboratories that are certified for drinking water analyses by states whose programs are approved by USLPA, and based on the results of the WS studies provided, the ISDH issues the following determination, pursuant to IC 4-21 5-3-5:

- The laboratory is hereby granted has certification to: antonom, arsenic barrian very fluor coconains thromam examide fluorely mercury makes solon un, mallaun copper lead our are, nicros, the regulated volatile organic compriseds (COC), vincl chloride, withallimeth inex (THM), 2.4 D. 2.4.5-1P. aluchlor, nenzoapperene (illordam), dellapon dit Vettiydicsyliaatpate di C-ethilliesyliphinalaie dinoseb entrop, hepticidor, repictidor epoxide hexachior benzene hexachiorocyclopentudiene I'ndane methoxychlor, pentachloroph, sol. p'cioram, s'insizmo and treaphen, (as indicated on the Michigan certification letter or certificate)
- The laboratory has been assigned laboratory number C-MI-04. This mamber is to be used on all reports used for compliance monitoring of public water supplies to the Indiana Department of I in frommental Management.

The expiration of Indiana certification will be the date that the laboratory's Michigan certification expires (November 15, 2009). The status of Indiana certification will be reviewed, and it necessary, downgraded by Indiana, when (1) an on-site evaluation by Michigan is Completed and a report of unsatisfactory performance is submitted by Michigan to the Indiana certification officer. In (2) the laboratory does not successfully malyze one (1) WS PE sample annually

In addition, the laboratory is required to provide the certification of theory with the following documents, as they become available: (1) any change in certification status or expiration date of the Michigan certificate, and (2) reports of WS PE sample analysis.

If you wish to seek review or stay of the effectiveness of this determination, pursuant to IC 4-21 5-3-7, you are required to submit, in writing, a petition, on or before landary 23, 2007, to,

Office of the Secretary Indiana State Department of Health 2 North Meridian Street Indianopolts, IN 46204

has petition for review or stay must include facts demonstrating that

- The petitioner is a person to whom the determination is specifically directed;
- The petitioner is appriezed or adve, sely affected by the agency determination, or
- The petitioner is entitled to review under any law

Questions concerning the certification status granted by this letter should be directed to Philip Zillinger Chemistry Laboratory Certification Officer, 317/233-8071.

Dated at Indianapolis Inciana, this 5th day of January 2007.

Sheerch

Robert Lindner, MD PhD Director ISDH Li baratories Indiana State Department of Health

Room MS2031B 635 N. Bardull Drive Indianapolis, IN 46262-5126

Tel: 317-233-8009 Fax: 317-233-8003

Email: Rlandner@asdh.state.in.us

A copy of this letter was sent on the above date, postage prepaid first class mad, to,

Sandra DeCastro Indiana Department of Lavironanental Monagement Drinking Water Branch 2525 North Shadeland Avenue Indianapolis, IN 46219

December 5, 2007 William G. Rauch

The exprantion of Indiana certification will be the date that the Inboratory's Michigan certification expires (November 15, 2009). The status of Indiana certification will be reviewed, and it necessary, downgraded by Indiana, when (1) an on-site evaluation by Michigan is completed and a report of unsatisfactory performance is submitted by Michigan to the Indiana certification officer, or (2) the laboratory does not successfully analyze one 41; WS PE sample annually

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- The petitioner is agginered or adversely affected by the agency determination or
- The petitioner is entitled to review under any law

Questions concerning the certification status granted by this letter should be directed to Philip Zillinger. Chemistry Laboratory Certification Officer, 317-233-8071

Dated at Indianapolis, Indiana, this 5th day of January, 2007.

Sincercly

Robert Lindger, MD PhD Director, ISDH Laboratories

Irdiana State Department of Health

Roem MS2031B 635 N. Barnfull Drive

Italianapolis, IN 46262-5126

163-317-233-8009 Fax 317-233-8003

Lorad Rlandner(g) is this tate, in, as

A copy of this fetter was sent on the above date, postage prepaid first class mad, for

Sandra DeCastro Indiana Department of Eastronmental Management Drinking Water Branch 2525 North Sladefand Avenue Indianapolis, IN 462.9



SCOPE OF CERTIFICATION KARTABORATORIES, INC KALAMAZOO MICHGAN

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CONTROLLED SUBSTANCE REGISTRATION CERTIFICATE UNITED STATES DEPARTMENT OF JUSTICE ORIGENFORCEMENT ADMINISTRATION WASHINGTON D.C. 20527

DEA PEGISTRATION NUMBER THIS BEC STRATION EXCIPEN RK0260529 FEE PAID 12-31-2009

PUNTUA 223MBLB ILSUL DATE ANALYTICAL LAB 11-05-2008 3.3N.4.5.

KAR I ABORATORIES 4425 MANCHESTER ROAD KALAMAZOO MI 49001-0000

Sections 304 and 1008 (21 USC 824 and 958) of the Controlled Substances Act of 1970, as amorded, provide that the Attorney General may revoke or suscend a registration to manufacture distribute, dispense import or export a controlled substance.

THIS CERTIFICATE IS NOT TRANSFERABLE ON CHANGE OF OWNERSHIP, CONTROL LOCATION, OR BUSINESS ACTIVITY AND IT IS NOT VALID AFTER THE EXPIRATION DATE

JENNIFER M. GRADHOLM BOVERNOR

CARTINE CONTRACTOR CON STATE OF MICHOAN DEPARTMENT OF COMMUNITY HEALTH

BOARD OF PHARMACY

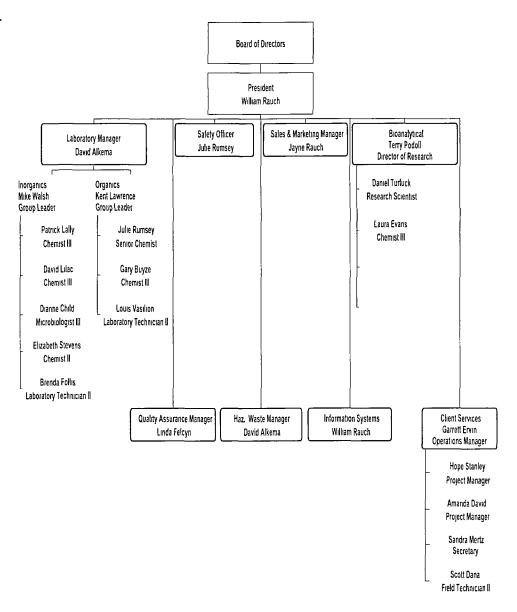
ANALYTICAL LABORATORY CONTROLLED SUBSTANCE LICENSE

VALID ONLY AT LOCATION BELOW

WILLIAM GERRIT RAUCH KAR BIOANALYTICAL INC HUSS MANGHESTER RD KALAMAZOO MI

\$ 0E\30\5010

AR Laboratories ORGANIZATION CHART 02/09/2009



4. KEY PERSONNEL

Employee	Title	Years @KAR	Years in Industry
William Rauch	President	22	29
Terry Podoll Ph.D.	Director of Research, Pharmaceuticals	1	13
David Alkema	Laboratory Manager	20	28
Linda Felcyn	Quality Assurance Manager	2	25
Garrett Ervin	Operations Manager	13	13
Kent Lawrence	Group Leader, Organics	13	21
Daniel Turluck	Research Scientist, Pharmaceuticals	2	25
Julie Rumsey	Senior Chemist, Organics	21	24
Michael Walsh	Group Leader, Inorganics	7	10

Curriculum Vitae for key technical staff follow.

CURRICULUM VITAE OF WILLIAM G. RAUCH

EDUCATION Northern Michigan University, 1974-1975

B.S Grand Valley State University, 1980, Chemistry major

EXPERIENCE

1995 to Present - President of KAR Laboratories, Inc. Directs business and management affairs. Oversees all price quotations Makes all hiring decisions and directs personnel evaluation program. Interacts with industrial clients, governmental agencies, consultants, and others Manages computerized information systems including LIMS and LAN systems. Oversees safety program, waste program, and instrument maintenance and repair programs. Supervises QA/QC program. Directs testing procedures and methods development. Responsible for acquisition or approval of all capital equipment and expenses. Oversees building and grounds maintenance and upkeep.

March, 1985 to 1995 - Technical Director at KAR Laboratories, Inc. Supervises all organic chemical analyses and metal analyses. Directs testing procedures and develops analytical methods. Manages computer systems including LIMS-LAN system. Supervises Quality Assurance program. Manages mobile laboratory services. Responsible for instrument maintenance and repair. Represents KAR Labs in communication with industry, government and individuals.

November, 1978 to March, 1985 - Organic Laboratory Director at Western Michigan Environmental Services, Inc. Responsible for operation of GC/MS/DS system and supervised all organic analyses. Directed Priority Pollutant and Toxic Substance evaluations Responsible for analytical procedures, project management, client contact and instrument maintenance

PROFESSIONAL AFFILIATIONS

American Chemical Society
Water Environment Federation

Analytical Laboratory Managers Association

OTHER. ACS Undergraduate Award in Analytical Chemistry, October, 1979.

CURRICULUM VITAE OF TERRY PODOLL

EDUCATION.

Ph.D. University of Washington, 1996, Medicinal Chemistry M.S. University of Washington, 1991, Organic Chemistry B.S. University of Texas, 1989, Chemistry

EXPERIENCE:

2008 to Present - Director of Research of KAR Bioanalytical, Inc. Manages all aspects of technical operations, assigns workloads, and supervises the laboratory staff. Oversees the hiring and training of chemists and technicians, ensuring compliance with regulations, corporate policies, and technical SOPs, as well as evaluates the performance of analytical systems and recommends capital expenditures and improvements. Schedules and monitors progress of assay validation and sample analysis through the laboratory and communicates project information to staff. Reviews laboratory results and writes final data reports. Responsible for new business development and assists clients in defining project objectives and laboratory strategies. Prepares price quotations for analytical services.

2007 - Senior Study Director, MPI Research, Inc. Interacted with external clients for study consultation, design, implementation, the scheduling, conduct, performance, monitoring, interpretation/evaluation of results, and reporting of various DMPK or other types of studies performed in one or more of the research departments, utilizing the staff and facility resources as necessary Participated in the expansion of capabilities of the ADME department, business development, budgeting, and marketing of ADME services

2001-2007 - Senior Principal Scientist, Pharmacia, then Pfizer Global Research and Development Project Representative on multiple cross-functional teams that forwarded the discovery and preclinical development of medicines designed to combat inflammatory diseases and microbial infections. Responsible for understanding the objectives of the teams and leading the appropriate personnel from early discovery through the end of exclusivity activities. Delivered high quality research for the timely delivery of key project milestones, including two IND submissions Supervised B.S.- and M.S.-level scientists.

1996-2001 - Senior Scientist, Cedra Corporation. Originated, designed, developed, implemented, and managed the In Vitro Sciences division. Study Director on drug metabolism projects including ex vivo and in vitro cytochrome P450 induction studies, in vitro cytochrome P450 inhibition studies, and metabolite and enzyme identification studies. LC/MS/MS methods development, validation and analysis of biological fluids for drugs and their metabolites. Reviewed data for accuracy and GLP compliance, and wrote reports

PROFESSIONAL AFFILIATIONS.

American Chemical Society

International Society for the Study of Xenobiotics

OTHER: National Research Service Award Fellow, UT Southwestern Med. Ctr 1996

Gordon Research Conference Travel Award, Drug Metabolism, 1994 Summer Research Fellow, Upjohn Research Laboratories, Kalamazoo, Ml, 1992 Robert A. Welch Predoctoral Fellowship, University of Texas, 1988

CURRICULUM VITAE OF DAVID R ALKEMA

EDUCATION: B S Calvin College, 1980, Chemistry major, Math-Physics minor.

EXPERIENCE. January, 2008 to present - Laboratory Manager at KAR Laboratories, Inc.

Oversees production and development in all organic and inorganic labs, performs final project validation, maintains SOPs, and manages lab waste program

December, 1989 to January, 2008 - Laboratory Supervisor at KAR Laboratories, Inc. Trained and supervised analysts performing all water quality, microbiology, physical property and waste analyses; developed SOPs and methods; at times supervised Client Services technicians and activities; managed lab waste program; consulted for clients, made technical presentations

October, 1988 to December, 1989 - Analytical Chemist at KAR Laboratories, Inc Performed various water quality, physical property and waste characterization analyses; developed methods and SOPs; managed lab waste program

October, 1983 to October, 1988 - Senior Chemist at Drug and Laboratory Disposal, Inc. Supervised technicians and all waste disposal operations at a licensed TSDF.

September, 1982 to October, 1983 - Director of Laboratories for Hope College Chemistry Department Managed all instructional laboratories; supervised student assistants, purchased chemicals and equipment, repaired equipment and instrumentation.

May, 1980 to September, 1982 - Toxicology Technician at Blodgett Memorial Medical Center Performed routine and emergency identification and/or quantitation of drugs, heavy metals and toxic substances in human body fluids.

Summer, 1979 - Testing Technician at BASF Wyandotte Corp Evaluated the essential color and vehicle base properties of proposed ink pigment standards

PROFESSIONAL AFFILIATIONS

Certified Hazardous Materials Manager (Master Level).

OF LINDA M. FELCYN

EDUCATION

B.S. Western Michigan University, 1980, Chemistry major, Biology minor

EXPERIENCE

July 2006 to Present - Quality Assurance Manager at KAR Laboratories, Inc Responsible for directing and training Laboratory Technicians and/or Chemist in Quality Systems Reviewing analytical data and reports for proper documentation, completeness, and accuracy. Implementing and monitoring Quality Systems Maintaining and archiving QA records and preparing and participating in internal and external audits

March 2003 to May 2006 - Compliance Specialist at Pfizer, Inc. Coordinated quality activities within R&D API manufacturing. Served as the primary point of contact between manufacturing and QA organizations. Carried out primary batch record review, closure of deviations, and batch record documentation. Coordinated SOP activities. Identified training needs to meet internal and external compliance.

March 2003 to December 2001 - Quality Assurance Professional at Pharmacia Corp Provided QA support to the API manufacturing organization. Independently reviewed and approved critical documents for GMP compliance, including master batch records, operation records, in-process deviations, change controls, and equipment/instrument qualification documents. Conducted audits and investigations to identify and resolve quality-related issues. Contributed to departmental SOPs. Generated documents for regulated activities.

June 1992 to December 1999 - Compliance Specialist at Leiner Health Products, Inc. Evaluated new and revised labeling for OTC drugs for the solids and liquids Coordinated preparation of label artwork with graphic design company Managed label life cycles. Compiled and submitted National Drug Code (NDC) number reports to FDA for manufactured and purchased products. Evaluated pre-audit information for contractors and new raw material manufactures

May 1986 to June 1992 - Quality Assurance Associate at Leiner Health Products, Inc. Interpreted GMP policies and guidelines for drug product manufacturing Developed departmental SOPs Completed cGMP audits for pre-weighing, granulation, compression, coating, and testing facilities Conducted GMP training for manufacturing groups Performed drug product batch record reviews

May 1982 to May 1986 - Chemist at Walgreen Laboratories, Inc.. Analyzed incoming raw materials for purity. Tested finished drug products for compliance to USP specifications Performed stability testing to support drug product expiration dates

June 1980 to May 1982 - Laboratory Technician at Warner Vineyards. Analyzed juice and wine for compliance with specifications

CURRICULUM VITAE OF GARRETT J. ERVIN

EDUCATION

BS Western Michigan University, 1994, Biology major, Geology minor

EXPERIENCE

November, 1997 to present - Senior Project Manager at KAR Laboratories, Inc. Client Services Department supervisor. Assists KAR clients in defining testing requirements and data quality objectives and helps determine appropriate analytical strategies. Ensures that scope of work satisfies both regulatory requirements and client project objectives. Responds to client inquiries and prepares bids and quotations for sampling and analytical services. Supervises the preparation and distribution of appropriate sample containers, preservatives, and project tracking documents.

May, 1996 to November, 1997 - Project Manager at KAR Laboratories, Inc Assisted KAR clients in defining testing requirements and data quality objectives Ensured that scope of work satisfied client project objectives. Responded to client inquiries and prepared bids and quotations. Was responsible for preparation and distribution of appropriate sample containers, preservatives, and project tracking documents. Performed field work as needed

May, 1994 to May, 1996 - Client Services Technician at KAR Laboratories, Inc. Prepared sample bottles and shipping containers, received samples, ascertained needs of clients, logged in projects, preserved samples and delivered samples to individual labs. Performed field sampling.

March, 1992 to May, 1994 - Pharmacy Technician at Meijer, Inc Customer service representative, entered computer data, filled prescriptions and interacted with Pharmacists on a professional level.

PROFESSIONAL AFFILIATIONS:

Michigan United Conservation Club Water Environment Federation

CURRICULUM VITAE OF KENT T. LAWRENCE

EDUCATION:

B.S. Michigan State University, 1983, Natural Resources major.

EXPERIENCE:

January 2008 to present - Group Leader at KAR Laboratories, Inc. Directs production activities in Volatile Organics and Semivolatile Organics departments, performs various analyses, trains analysts, and maintains SOPs.

July, 1994 to January, 2008 - Laboratory Supervisor at KAR Laboratories, Inc Responsible for all analyses of water, wastewater, soil, and waste samples for semi-volatile organic compounds according to EPA methods. Directs all activities in the sample preparation laboratory. Responsible for maintenance of instrumentation and equipment. Supervises staff, evaluates equipment needs, and directs all semi-volatile organic analysis performed by GC/MS, and GC with Flame lonization, Electron Capture Detector and Nitrogen-Phosphorus Detectors

July, 1991 - July, 1994 - GC/MS Group Leader at ENCOTEC Responsible for supervision and management of the GC/MS department Duties consisted of purchasing supplies and instrumentation, business planning, interviewing, analyst training, quality assurance plan and scheduling

July, 1987 to July, 1991 - Senior Chemist (GC/MS) at ENCOTEC Responsible for GC/MS analyses of volatile and semi-volatile environmental samples according to EPA methods Responsible for maintenance and troubleshooting of all GC/MS systems

July, 1986 to July 1987 - Extractions Chemist at ENCOTEC

PROFESSIONAL AFFILIATIONS.

American Chemical Society

CURRICULUM VITAE of DANIEL TURLUCK

EDUCATION

B S. University of Wisconsin, 1985, Chemistry major Undergraduate studies in Chemical Engineering University of Wisconsin, 1976-1978

EXPERIENCE:

November 2005 to Present - Research Scientist at KAR Laboratories, Inc. Develops and/or performs complex analytical chemical analyses using sophisticated instrumentation, most commonly triple-quad LC/MS Troubleshoots equipment and procedural problems and recommends new capital equipment purchases to management Advises and trains Pharmaceutical Laboratory staff.

July 2004 to November 2005 - Senior Scientist, at Pfizer, Inc. in Kalamazoo MI Isolate unknown compounds using analytical HPLC and preparative LC/UV and LC/MS to prepare compounds for spectroscopic analysis.

April 1987 to June 2004 - Senior Scientist, Pfizer, Inc in Ann Arbor MI. Conducted in-vivo and in-vitro experiments to study drug metabolism/pharmacokinetics. Develop and perform bioanalytical assays for the quantitative determination of drugs and metabolites in biological fluids. Utilized Watson LIMS for all study protocols and data. Promotions. Senior Scientist (Pfizer) 2000 - 2004, Scientist (Parke-Davis) 1997-2004, Senior Associate. Scientist (Parke-Davis/Warner-Lambert) 1993-1997, Associate Scientist (Parke-Davis/Warner-Lambert) 1990-1993, Senior Assistant Scientist (Warner-Lambert) 1987-1989.

1995 to 1996 - Instructor at Washtenaw Community College in Ypsilanti, Ml. Teach evening General Chemistry class

1986 to 1987 - Senior Chemist at Environmental Control Technology Corporation in Ann Arbor, MI. Conducted analytical testing for organic environmental pollutants in waters and soils using GC/FID/EC/NPD.

1981 to 1986 - Chemist at Raltech / Hazelton/Covance in Madison, WI. Conducted analytical testing on agricultural and consumer products

PUBLICATIONS:

"A Novel Predictive Pharmacokinetic/Pharmacodynamic Model of Repolarization Prolongation Derived from the Effects of Terfenadine, Cisapride and E-4031 in the Conscious Chronic AV node-ablated, His bundle-paced Dog." Nolan E R, Feng M R, Turluck D A, et al , Journal of Pharmacological and Toxicological Methods (in press for 2005).

"Evidence for glucuronide conjugation of p-nitrophenol in the Caco-2 cell model." Rose S E, Turluck D A et. al., Pharmaceutical Research 1991, 8(11)

"Pharmacokinetics and Bioavailability of CI-977 in Rats and Dogs." Barksdale C M, Guttendorf R J, Turluck D A, et al., J Clin Ligand Assay 1997, 20.206-211.

"a-Substituted Malonester Amides. Tools to Define the Relationship between ACAT Inhibition and Adrenal Toxicity." Sliskovic D.R., Picard J.A., Turluck D.A., et al., J. Med. Chem. 1998, 41, 682-690.

"Rising Dose Proportionality of Enadoline (CI-977) in Rats and Dogs." Barksdale C M, Turluck D A, Guttendorf R J, et. al., J Clin. Ligand Assay 1999; 22:310-315

"Brain Microdialysis and PK/PD Correlation of Pregabalin in Rats" Feng M R, Turluck D A, et. al, European Journal of Drug Metabolism and Pharmacokinetics 2001, Vol. 26, No. 1/2, pp. 123-128

"Bioavailability, Pharmacokinetics and Autoradiographic Distribution Studies with PD 129290, a Novel Analgesic Kappa Opioid Receptor Agonist" C M Barksdale, W P. McNally, G D. Nordblom, M.J. Coon, P D. DeHart, D S Wright, R J Guttendorf, D Turluck, L A. Pachla, and T Chang. Presented at the Society for Neuroscience, 1989 Annual Meeting, Phoenix, Arizona.

"Pharmacokinetics and Bioavailability of the Kappa Analgesic PD 129290 Following Various Routes of Administration." R.J. Guttendorf, D.A. Turluck, D.S. Wright, M.J. Coon, C.M. Barksdale, G.D. Nordblom, and L.A. Pachla. Presented at the Society for Neuroscience, 1989 Annual Meeting, Phoenix, Arizona

"Mass Balance and Metabolite Profile of 3H-PD 129290 after Intramuscular (IM) and Intravenous (IV) Administration to Beagle Dogs and IM Administration to Wistar Rats." R J Guttendorf, D A Turluck, D S. Wright, T D. Parker III, and L A Pachla Presented at the Society for Neuroscience, 1989 Annual Meeting, Phoenix, Arizona

"PD 148817: A Potent and Bioavailable ACAT Inhibitor with Antiatherosclerotic Activity in Cholesterol Fed Rabbits." D R Sliscovic, J A Picard, D.A. Turluck et. al Presented at the XII International Symposium on Drugs Affecting Lipid Metabolism Houston, TX, November 7-10, 1995

PROFESSIONAL AFFILIATIONS

American Chemical Society (ACS)

CURRICULUM VITAE OF JULIE ANN RUMSEY

EDUCATION

B.S. Western Michigan University, 1983, Chemistry major, Agricultural Science minor

EXPERIENCE

November, 1993 to present - Senior Chemist/Safety Officer at KAR Laboratories, Inc. Performs volatile organic chemical analyses on water, wastewater, liquid/solid waste, soil and other types of samples using GC/MS, GC and Total Organic Carbon instrumentation. Acts as sample coordinator for the organics section. Functions as Safety Officer, with responsibility for a safe working environment and safe laboratory practices. Administers corporate Chemical Hygiene and Emergency Response Plans, and monitors compliance with "Right to Know" requirements

April, 1986 to October, 1993 - Chemist II and Safety Officer at KAR Laboratories, Inc. Analyzed environmental samples for organic chemicals utilizing GC and GC/MS, HPLC and Total Carbon systems

March, 1984 to November, 1985 - Senior Lab Analyst, at L. Perrigo Company Performed physical and chemical testing on raw materials and products. Directed the Control Sample Program and performed troubleshooting, calibration and maintenance of laboratory instrumentation

August, 1983 to February, 1984 - Analytical Chemist at International Research and Development Corporation. Performed analyses utilizing HPLC, GC, and IR.

PROFESSIONAL AFFILIATIONS. American Red Cross Certified First Aid and CPR, through 2009

CURRICULUM VITAE OF MICHAEL T. WALSH

EDUCATION: B S Rose-Hulman Institute of Technology, 1986, Chemistry major.

M.S. Mississippi State University, 1992, Forest Products

EXPERIENCE:

January, 2008 to present - Group Leader at KAR Laboratories, Inc Directs production activities in Water Quality and Trace Metals departments, performs various analyses, trains analysts, maintains SOPs, and assists in waste management duties

February, 2003 to January, 2008 - Senior Chemist at KAR Laboratories, Inc. Performed water quality analyses, trained analysts, and assisted in waste management duties

August, 2000 to February, 2003 - Chemist II at KAR Laboratories, Inc. Performed water quality analyses, trained analysts, and assisted in waste management duties.

May, 1999 to April, 2000 - Laboratory Supervisor at Bay City (Michigan) Wastewater Treatment Plant Directed staff performing standard wastewater analyses, directed and performed special projects; developed and maintained SOPs.

November, 1998 to February, 1999 - Environmental Chemist at Total Petroleum, Inc. in Alma, Michigan Performed standard wastewater analyses

October, 1997 to October, 1998 - Laboratory Technician at Wastewater Treatment Plant in Saginaw, Michigan

August, 1995 to September, 1997 - Substitute Teacher in various high schools in Saginaw County

August, 1990 to April, 1993 - Research Assistant at Mississippi Forest Products Laboratory in Starkville, Mississippi

June, 1986 to June, 1990 - United States Army Officer stationed at Fort Campbell, Kentucky. Honorable discharge with rank of Captain

OTHER: Completed Sacramento Course for WWTP Operator - Level 1

6. FACILITIES AND MAJOR EQUIPMENT

KAR Laboratories occupies a 21,000 square foot facility Individual laboratories include Trace Metals, Metals Sample Prep, Volatile Organic, Semi-volatile Organic, Organic Sample Prep, Water Quality, Microbiology, Hazardous Waste and Physical Properties, Air Toxics, HPLC and Pharmaceuticals Most of these Laboratories have dedicated utilities and equipment, such as heating/cooling systems, sinks, fume hoods, gas supplies, and glassware Major equipment includes the following

Data Handling/LIMS Computerized System

Hewlett-Packard Rack System /E41

- (1) Hewlett-Packard Proliant DL380 Xeon based server, redundant 2.5GB RAM, redundant power supplies, Hot Swap PCI, two 15,000rpm 36GB ULTRA320 Hot-Swap drives, duplexed (RAID 0)
- (3) Hewlett-Packard Proliant DL140 Xeon server, 2GB RAM, Hot Swap PCI, 80GB ATA drive
- (3) Hewlett-Packard NetServer LP2000R Pentium III based servers, 3GB RAM, two 10,000rpm 18.2GB SCSI3 drives, duplexed
- (4) Hewlett-Packard NetServer LP1000R Pentium III based server, 1GB RAM, 10,000rpm 18 2GB SCSI3 Hot Swap drive
- (27) Intel Pentium-based Desktop or Tower PC's
- (34) Intel Pentium -based Notebook PC's
- (5) Intel 80486-based Desktop or Tower PC's
- (2) Canon D-6080 60ppm scanner/PDF creator
- (9) digital scanners
- (2) Hewlett-Packard Color LaserJet 85xxDN printers, 24 pages-per-minute, with Duplexer, 3000-sheet capacity, Hard Disk Drive, and 8-bin Multi-user Mailbox
- (2) Xerox Color Laser 6350DX printer, 36 pages-per-minute, with Duplexer, 1800-sheet capacity, Hard Disk Drive
- (9) Hewlett-Packard laser printers
- (7) Ink-jet color printers
- (16) dot matrix printers

Rose Electronics ServeView 12-channel monitor/keyboard/mouse switch

Computer Associates BrightStore ArcServelT for Netware tape backup software

HP 1016 Ultrium 460 tape changer, 400 gigabyte x16

- HP DAT tape changer, 40 gigabyte x 6
- (3) 24-port gigabyte ethernet switches
- (12) Gibabyte Ethernet switches
- (9) HP and Axis Print Servers

Cisco 1605 T-1 (Internet) Router

APC Smart-UPS XL Rack 3000 Battery Backup running PowerChute Web software

- (4) Novell 5 1 SP8 Network Operating Systems
- (2) Windows 2000 Server Operating Systems

Novell BorderManager 3.7 Communications Server software

KAR-developed and supported LIMS software (Environmental division)

Innaphase Watson LIMS software (Pharmaceutical division)

Infinite Technologies ExpressIT! Electronic Mail System and Router (software)

Infinite Technologies InterChange Internet Electronic Mail Server (software)

Infinite Technologies Scheduler (group scheduling software)

Computer Associates FaxServelT 6 0 for Netware server-based faxing software and 4 channel

BrookTrout Fax board w/ one dedicated incoming line and 2 dedicated outgoing lines

Computer Associates InnoculateIT 7 Netware server-based anti-virus software

Computer Associates InnoculateIT 7 workstation-based anti-virus software

SurfControl Email Filter software

SurfControl Web Filter software

Major Equipment shared among Laboratories

lonpure Series 120 Reverse Osmosis System including hot/cold tap water feed, carbon pre-filtration, water softener, RO stage, anionic and cationic exchange beds, UV treatment and final ultra-filtration Walk-in sample cooler (12' x 10') with alarm

Compressed Air System, Gardner-Denver Model ASD, B, Refrigerator Air Dryer, Model UAZO AC

Argon Distribution Manifold System, LC-91

Balston 75-80 Zero Air Generator

Balston 75-76 Nitrogen Generator System

Whatman 75-32NA Hydrogen Generator (99.99999%)

Whatman 75-34NA Hydrogen Generator (99 99999%)

Misc. Electronic flow meters, Electronic leak detectors

Major Equipment for the Pharmaceuticals Laboratory

LC-MS/MS

(2) API 3000 (Sciex) Triple Quadrupole Liquid Chromatograph-Mass Spectrometer, mass range 5-3000, APCI Heated Nebulizer Ion Source, Analyst Software Version 1.4, and HP Laserjet printer (2) Micromass® Quattro Triple Stage Quadrupole Liquid Chromatograph-Mass Spectrometer, 4000 Daltons mass range, with Waters 2690 HPLC, refrigerated autosampler, column heater, and MassLynx-NT Workstation, software, and laser printer

HPLC

- (2) Waters 2795 HPLC's with refrigerated Autosampler and Thermostatic Column Chamber
- (5) Waters 2695 HPLC's with refrigerated Autosampler and Thermostatic Column Chamber
- (5) Waters 2487 dual wavelength UV detectors
- (2) Waters Model 470 Programmable Scanning Fluorescence HPLC Detectors
- (1) ESA Coulechem II Electrolytic Conductivity HPLC Detector
- (1) Waters Model 410 Differential Refractometer HPLC Detector

CHROMATOGRAPHY DATA SYSTEMS

Waters Millennium M32 Ver 4 0 Client/Server system with file server, three clients, two acquisition servers and three Laserjet printers

MISC

Hewlett-Packard 8452 Diode Array Scanning UV-Vis Spectrophotometer with Pentium-based PC, General Molecular Devices EMAX Microplate Reader (for antibody assays and ELISA testing) with SOFTmax PRO software, Pentium-based PC and printer

Cahn C-33 Ultra-Microbalance, 0 001 milligram resolution

Mettler Toledo AG285 Dual Range analytical balance

Sorvall RC-5B refrigerated superspeed Ultracentrifuge

Eppendorf 5415C Ultracentrifuge

- (2) Eppendorf 5415D Ultracentrifuge
- (2) VWR VX-2500 Multitube Vortexer

Miele G7733 Professional Laboratory Glassware Washer

(2) St. Charles 48 inch fume hoods with low face velocity warning sensor

So-Low Environmental Equip Co. 12 cu ft C85-12 Chest Freezer (-85℃)

So-Low Environmental Equip Co. 25 cu ft. DH30-27MDSD Upright Freezer (-85C)

So-Low Environmental Equip. Co. 27 cu ft. DH30-27MDSD Upright Freezer (-10C to -30C)

(2) So-Low Environmental Equip Co 30 cu.ft. DH30-30MDSD Upright Freezer (-10C to -30C)

GE Refrigerator/Freezer Model TB145YC

RCA Refrigerator/Freezer Model MSX22G

Major Equipment for the Trace Metals Lab:

Liebert dedicated HEPA-filtered class 10,000 clean room

Varian 820 ICP-MS Spectrometer with a 90-degree reflecting ion optic system, a triple stage vacuum system, Discrete Dynode Electron Multiplier (DDEM) detector, and unique Collision Reaction Interface (CRI) for reduced interferences

Hewlett-Packard 4500 Inductively Coupled Plasma Mass Spectrometer (ICP-MS) with Autosampler, data system and printer

(2) Perkin-Elmer Optima 4000 Dual View Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES), autosampler, data system and printer

Varian AA-400 Zeeman Atomic Absorption/Atomic Emission (AA/AE) Spectrophotometer with GTA96Z Graphite Tube Atomizer, PSD-96Z Programmable Sample Changer, PC and printer

Varian AA-20 Atomic Absorption/Atomic Emission (AA/AE) Spectrophotometers with GTA96 Graphite Tube Atomizer, PSC-56 Programmable Sample Changer and printer

Varian VGA-76 Vapor Generator Accessory

Nippon RA-3000 Mercury Analyzer with Autosampler, PC, printer

PS Analytical Millennium Merlin Ultra-Trace Mercury Analyzer system, with autosampler, H-P 4150 Pentium-based notebook PC and printer

Miele G7783 Professional Laboratory Glassware Washer

- (2) Environmental Express 54-place Block Digesters
- (2) Environmental Express fume hoods with HEPA filters

AirClean AC3000 36" polypropylene ductless acid hood with HEPA filtration, filter/airflow monitor w/ alarm Precision Scientific Controlled Temperature Water Bath

Major Equipment for the Volatile Organics Laboratory:

GC-MS

- (1) Hewlett-Packard 5972B Gas Chromatograph-Mass Spectrometer (GC-MS) with Electronic Pressure Control and Ion Gauge, H-P 3000 Purge & Trap Liquid Sample Concentrator, OI Analytical 4552 Water/Soil Autosampler, H-P Pentium-based PC running Windows NT and H-P Laserjet printer
- (1) Hewlett-Packard 5972B Gas Chromatograph-Mass Spectrometer (GC-MS) with Electronic Pressure Control and Ion Gauge, Tekmar 3100 Purge & Trap Liquid Sample Concentrator, OI Analytical 4552 Water/Soil Autosampler, H-P Pentium-based PC running Windows NT and H-P Laserjet printer
- (1) Hewlett-Packard 5971 Gas Chromatograph-Mass Spectrometer (GC-MS) with Tekmar LSC-2000 Purge & Trap Liquid Sample Concentrator, OI Analytical 4552 Water/Soil Autosampler, H-P Pentium-based PC running Windows NT and H-P Laserjet printer

<u>GC</u>

Tracor 9000 Gas Chromatograph with Photoionization (PID) and Hall Electrolytic Conductivity (HECD) Detectors

(2) Varian 3600 Gas Chromatographs with Tracor 703 Photoionization (PID) and Hall 1000 Electrolytic Conductivity (HECD) Detectors

MISC.

Fisher XT410 Top Loading Electronic Balances Westinghouse refrigerator

Northland Imperial refrigerator

Justice Innovations Chromatography Data System (4-channnel) with ChromPerfect for Windows software running on a Pentium-based PC with printer

Major Equipment for the Semi-Volatiles Laboratory:

GC/MS

- (1) Thermo Finnigan Trace DSQ GC-MS with Large Volume Injector, Vacuum Probe Interlock, TriPlus Autosampler, NIST Mass Spectral Library, and Prolab Resource Plus ChemStation software for 21CFR Part 11 compliance (GLP).
- (2) Finnigan MAT Magnum Gas Chromatograph-Mass Spectrometers with Leap Technologies A200S Autosampler, Compaq 486 PC and printer

GC

- (2) Tremetrics 9001 Gas Chromatographs with dual Electron Capture Detectors (EC) and Leap Technologies A200S Autosampler
- (3) Tremetrics 9001 Gas Chromatograph with dual Flame Ionization Detectors (FID) and Dynatech GC411V Autosampler

Tremetrics 9000 Gas Chromatograph with Nitrogen-Phosphorus Detector (NPD) and Photoionization Detector (PID) with Dynatech GC411V Autosampler

HPLC

Waters LC Module 1 High Performance Liquid Chromatographs (HPLC), binary gradient, with Model 486 Programmable UV Detector, ESA Coulechem II Electrolytic Conductivity HPLC Detector, 717 Autosampler and Thermostatic Column Chamber

CHROMATOGRAPHY DATA SYSTEMS

(4) Justice Innovations Chromatography Data Systems (4-channels each) with ChromPerfect for Windows software running on Pentium-based PC's with printers

Major Equipment for the Organic Prep Lab:

Dionex ASE-200 Accelerated Solvent Extractor Workstation

Tekmar AutoTrace 6 position automated Solid Phase Extraction Workstation

- (2) Lab-Line Model 6000 variable speed liquid-liquid extracting devices
- (4) Zymark Turbovap Automated Sample Concentrators
- (4) Heat Systems XL2020 Sonic Dismembrators

VWR Genie 2 Vortex Mixer

Burrell 20-position Wrist-Action Shaker

Thermolyne Model 1300 Muffle Furnace

Labline Junior Orbital Shaker

International Equipment Co. Size 2 Centrifuge

Heraeus Instruments Megafuge 1.0 centrifuge

Eppendorf 5415C Ultra-Centrifuge

(13) Continuous Liquid-Liquid Extractors

Kontes Automatic Concentrator

(3) St. Charles 72 inch fume hoods with low face velocity warning sensors and explosive vapor alarms

Labconco 72-inch Protector Laboratory Hood

Fisher Scientific 72-inch Laboratory Hood

Central Scientific Drying Oven

VW1310E Drying Oven

Sanplatec Drykeeper Desiccator

(3) Sample Refrigerators

Standards Refrigerator

Precision Scientific Water Bath

Mettler H80 Balance

Mettler BB300 Balance

Mettler PM 4600 Analytical Balance

Supelco Model 5-7030M Vacuum Manifold

(3) Wheaton Milli-mole Diazomethane Generators

Miele G7733 Professional Laboratory Glassware Washer

Major Equipment for the Water Quality Laboratories:

OI Analytical Flow Solution 3100 Automated Ion Analyzer, dual channel with photometric and amperometric detection Westco SmartChem Discrete Analyzer with data system and printer

Lachat QuikChem AE Flow Injection Analysis autoanalyzer with 486-based PC and printer

Lachat QuikChem 8000 Ion Chromatograph with Pentium-based PC and printer

Purpose and Advanced Software, and Printer

(2) Thermo Spectronic Genesys 20 Model 4001/4 Spectrophotometers

Hach DR/2 Spectrophotometer (UV-Vis)

Perkin-Elmer 1600 Fourier Transform Infrared Spectrophotometer (FTIR)

Mettler PM460 Top-loading Balance

Sartorius B120S Analytical Balance

Orion 720SA pH/ISE Meter

Orion 611 pH/ISE Meter

Mettler-Toledo ScreenEasy pH/ISE Meter

(2) Orion Model 97-08 Dissolved Oxygen Probes

Princo Nova Barometer

(2) Incutrol/2 BOD Incubator Regulators

Fisher Scientific low temperature incubator, 20 cu ft

Woods 17 cu ft incubator

S?P Vortex Mixer

White-Westinghouse 17.5 cu ft. Refrigerator

General Electric 11.5 cub ft Refrigerator

(2) Labconco Protector 72 Fume Hoods

Labconco Protector 48 Fume Hood

- (2) Labconco Acid Digestion Hoods
- (2) Miele G7883 Professional Laboratory Glassware Washers

Lachat BD-46 Block Digestor

(2) Hach COD Reactor

Lachat Micro Distillation System

(2) Kontes 10-place Midi-Vap 2000 Cyanide Distillation Systems

Major Equipment for the Microbiology Laboratory:

Nikon SMZ-2T Stereoscopic Microscope

Nikon Labophot Microscope with photographic capabilities

Precision Scientific Model 260 Circulating Water Bath

Equatherm Water Bath

(2) Precision Scientific Gravity Convection Incubators

Tuttnauer Brinkmann 2540-E Autoclave

Quebec Colony Counter

Schuco Vacuum Pump

(2) Excellence 4 5 cub. ft. Refrigerators

Welbilt 4.5 cu ft Refrigerator

Sartorius H160 Top-loading Balance

Major Equipment for the Hazardous Waste Laboratory:

Ohaus Adventurer Model AV114 Analytical Balance

Ohaus AS60 Analytical Balance

Fisher XD-800 Top-loading Balance

- (8) Associated Design Zero Headspace Extractors
- (2) Associated Design Gas-tight Syringes

VWR Model 1326 Convection Oven

Blue M Model SW-17TA-1 Convection Oven

Lindberg/Blue M OV-480A Convection Oven

Precision Scientific Model 4 Convection Oven

Blue M Model M25A-2A Muffle Furnace

Precision DD20 Vacuum Pump

International Equipment Floor Centrifuge TCLP Dual Rotary Extractor Meinzer Model 11 Sieve Shaker Labconco Protector 72 Fume Hood

Major Equipment for the Physical Properties Laboratory:

Parr Oxygen Bomb Calorimeter with Pellet Press

Parr Model 1710 Calorimeter Controller w/ digital thermometer

(2) Pensky-Martens Closed Cup Flash Point Testers

Fisher Scientific Karl Fischer Moisture Analyzer

- (4) Sanplatec Drykeeper Desiccators
- (2) Boekel Desiccators

Brookfield RVT Viscometer

Major Equipment for the Carbon Laboratory:

OI Analytical Model 1010Carbon Analyzer with Autosampler and printer Fisher XT410 Top Loading Electronic Balance

Major Equipment for the Air Toxics Laboratory:

TO-14 System

Finnigan-MAT Magnum GC-MS Gas Chromatograph-Mass Spectrometer with PC and printer

Entech Model 7000 Preconcentrator

(2) Entech Model 7016CA Canister Autosamplers

Entech Model 3000 Canister Cleaning System

(78) 6-Liter Summa canisters

Entech CS1200E canister flow controller

Entech TM1000 Digital Timer with battery charger

Linde FM4660 Mass Flowmeter/Flow Controller/Totalizer

Entech SmartLab 7100/7000 Concentrator Software

(6) Entech Series E Flow Controllers

MISC

- (6) SKE Battery-operated Personal Sampling Pumps, with cyclones, chargers, and accessories
- (1) Dragar Air Sampling & Analysis Kit, with Hand Pump and tubes
- (1) Supelco Tedlar Bag Evacuation Chamber
- (32) 250mL 2-Valve Glass Gas Sampling Bombs
- (1) EPA Method 25E (Vapor Pressure) Field Sampling Apparatus

Major Equipment for Client Services and Field Services:

ISCO GLS Automatic Composite sampler with inside manhole suspension equipment

(6) ISCO 2910 Automatic Composite samplers with inside manhole suspension equipment

ISCO 2700 Sequential/Discrete sampler

Beckman Model 250 pH/Temperature/MV portable field meter

VWR Model 3150 pH/Temperature/MV portable field meter

VWR Model 2052 Conductance portable field meter

12V Shuco-Vac portable field filtration unit

Solinst Groundwater Level Meter

Wildco Model 1200 Kemmerer sampler

SKC Vac-U-Chamber for Tedlar Bags

Three (3) HDPE Dip-cup samplers

Three (3) PVC groundwater bailers for 2" monitoring wells

Stainless steel bailer for 2" monitoring wells

Stainless steel bailer for 1 5" monitoring wells

Orion Model 720A Stationary pH meter w/ThermoOrion PerpHecT Ross Electrode

YSI Model 32 Stationary Conductance meter

2004 Dodge Dakota Quad-Cab SLT 4x4 pick-up

1994 Ford Escort Wagon

1999 Chevy Express Cargo Van

KAR LABORATORIES ENVIRONMENTAL STANDARD OPERATING PROCEDURE (SOP) INDEX

General/QA

KG010 Freezer and Refrigerator Temperature Monitoring and Maintenance

KG018 The Calibration and Use of Laboratory Balances

KG022 Environmental Internal Audit Program

KG023 Generation and Maintenance of Environmental SOPs

KG024 Environmental Laboratory Training Program

KG026 Environmental QC Review for Data Challenges

KG031 Receiving and Reporting of Domestic Drinking Water Samples

KG032 Environmental Data Reduction, Validation and Reporting

KG033 Faxing Completed Laboratory Reports

KG034 Chemical Inventory Procedures

KG035 Environmental Quality Control Charting

KG036 General Maintenance/Repairs and Preventive Maintenance for

Environmental Laboratories

KG040 Storage, Archiving, and Disposal of Environmental Laboratory Records

KG050 External Audits of the Environmental Laboratory

KG055 Facilities and Utilities: Use and Maintenance

KG066 Handling, Labeling, and Assigning Expiration Dates to Chemicals and

Consumables

KG070 Laboratory Investigations

KG900 Responding to Power Outages, Disasters, and Security Violations

KG990 Electronic Data Deliverables

KGSDWA Special Considerations for Drinking Water Samples

GP921 Control Measures for Bloodborne Infectious Diseases

Client Services

KC020 Sample Receipt, Handling and Storage (Chain-of-Custody)

KC030 New Project Login

KG031	Receiving and Reporting of Domestic Drinking Water Samples
KC100	Dissolved Sample Preparation of Metals Analysis
KC120	The Collection of Residential Water Samples for the Analysis of Bacteria
KC130	Collection of Industrial Wastewater Samples
KC200	Sampling for Ultra-Trace Mercury
KC220	Determining the Conductivity of a Water at 25° C
KC230	The Determination of Color in Water
KC420	Measurement of pH in Water by the Electrometric Method

<u>Microbiology</u>

KB010	Operation of the Brinkmann/Tuttnauer 2540E Autoclave
KB020	The Use of Aseptic Technique in Microbiological Analyses
KB025	The General Care and Use of Microscopes
KB030	Heterotrophic Plate Count by Pour Plate Method
KB035	The Detection and Enumeration of <i>Pseudomonas aeruginosa</i> Bacteria Using a Membrane Filter Technique
KB050	Monitoring Requirements and Equipment Maintenance for Microbiology Procedures
KB057	The Preparation of Media for Microbiological Analyses
KB060	Preparation of Phosphate-Buffered Rinse/Dilution Water
KB064	Use and Care of the Water Baths in the Microbiology Lab
KB070	The Preparation of a Positive Control for Coliform Analysis and Other Microbiological Analyses
KB100	Total Coliform Bacteria by the Membrane Filter Procedure
KB110	Total Coliform Bacteria and E. coli by the Chromogenic Substrate Procedure
KB150	The Detection and Semi-Quantitation of Coliform Bacteria using the Multiple Tube Fermentation Technique
KB155	The Detection and Semi-Quantitation of Fecal Coliform Bacteria using the Multiple Tube Fermentation Technique
KB200	Fecal Coliform Bacteria by the Membrane Filter Procedure
KB210	E. coli Bacteria by the Membrane Filter Procedure
KB215	Quantitation of Coliform and E. coli Bacteria by Membrane Filtration using m-ColiBlue24®

KB250 Iron Bacteria (Presence-Absence) by Microscopic Examination

KB600 The Detection and Quantitation of Yeast and Mold in Water

Trace Metals

KM010 Glassware Washing - Trace Metals Laboratory
 KM050 Testing of Brass Fittings for Lead by NSF-61
 KM100 Mercury Analysis by Cold-Vapor Generation

KM120 The Preparation of Soil Fractions for Lead Analysis

KM150 Trace Metals Analysis Using the Perkin Elmer 4300 DV Inductively Coupled

Plasma-Optical Emission Spectrometer

KM160 Analysis for Boron by Inductively Coupled Plasma-Optical Emission

Spectrometry (ICP-OES)

KM170 Analysis for Phosphorus in Water by Inductively Coupled Plasma-Optical

Emission Spectrometry (ICP-OES)

KM175 Acid Digestion of Sediments, Sludges, and Soils for Metals Analysis

KM200 The Determination of Trace Metals in Waters by Inductively Coupled

Plasma-Mass Spectrometry

KM301 Aqueous Sample Preparation by Acid Digestion for Trace Metals Analysis

using the Environmental Express Block Digester

KM551 Nephelometric Determination of Turbidity using a Turbidity Meter

KM600 Analysis of Metals by Flame Atomic Absorption Spectrometry

KM1631 Determination of Trace Mercury in Water by EPA Method 1631E

KM6020 Determination of Trace Metals in Waters and Wastes by Inductively Coupled

Plasma - Mass Spectrometry

Semi-Volatiles

KO001 Solution and QC Batch Labeling for Sample Preparation in Semi-Volatile

Laboratories

KO005 Semi-Volatile Lab Glassware Washing Procedure
KO006 Cleaning and Deactivation of GC Injector Liners

KO504-1 1,2 Dibromomethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) by

EPA Method 504 1

KO515-1 The Determination of Chlorinated Phenoxy-acid Herbicides in Drinking Water

by EPA Method 515.1

KO515-1P Herbicide Sample Preparation by EPA Method 515.1

KO525-2 METHOD 525 2 Determination of Organic Compounds in Drinking Water by

Liquid-Solid Extraction and Capillary Column Gas Chromatography/Mass

Spectrometry

KO605 Benzidines by HPLC

KO1664 Hexane Extractable Material (HEM) and Silica Gel-Treated N-Hexane

Extractable Material (SGT-HEM) by Extraction and Gravimetry

KO1664 SPE Hexane Extractable Material (HEM) and Silica Gel-Treated N-Hexane

Extractable Material (SGT-HEM) by Solid Phase Extraction (SPE) and

Gravimetry

KO3500B TurboVap Concentration

KO3510 Separatory Funnel Extraction by Method EPA 3510C

KO3520 Continuous Liquid-Liquid Extraction by Method 3520C

KO3535 METHOD EPA 3535 Solid Phase Extraction (SPE)

KO3545 Accelerated Solvent Extraction (3545)

KO3550 Ultrasonic Extraction by EPA 3550B

KO3550B Herbicide Soil/ Sludge/Waste, or Wipe Extraction Procedure by EPA Method

3550B

KO3580A Waste Dilution by EPA Method 3580A

KO3620B Florisil Cleanup by EPA Method 3620B

KP3660A Sulfur Cleanup by EPA Method 3660A

KO3665A Sulfuric Acid/Permanganate Cleanup by EPA Method 3665A

KO8011 For 1,2-Dibromomethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP)

by EPA Method 8011

KO8015FID1 Methanol and Ethanol by GC/FID (Method 8015)

KO8015FID2 Miscellaneous Compounds by Gas Chromatography and Flame Ionization

Detection (Method 8015)

KO8015FID3 Ethylene and Propylene Glycol by Gas Chromatography and Flame

Ionization Detection (Method 8015)

KO8015-NPD1 Nitrogen Containing Compounds by Gas Chromatography and Nitrogen

Phosphorous Detection (Method 8015)

KO8015-NPD2 Triethylamine Low Level by Gas Chromatography and Nitrogen Phosphorous

Detection (Method 8015)

KO8081A Analysis of Pesticides by EPA Method 8081A

KO8082 Analysis of Polychlorinated Biphenyls (PCBs) by EPA Method 8082A

KO8082-oil Extraction of PCB's in oil

KO8150-DZO Diazomethane Generation using MNNG and Sodium Hydroxide for Methods

515 1 and 8151A

KO8151 Analysis of Herbicides by EPA Method 8151A

KO8151A-PRE Herbicide Sample Preparation by EPA Method 8151A

KO8270C Semi-Volatile Compounds by GC/MS (8270C)

KO8270C LVI Semi-Volatile Compounds by Large Volume Injection and GC/MS (8270C)

KO8270-DRO Diesel Range Organics - Total Petroleum Hydrocarbons by GC-MS (Method

8270)

KO8270-ORO Total Petroleum Hydrocarbons - Diesel Range Organics (DRO) and Oil

Range Organics (ORO) by GC/MS (Method 8270)

KO8315.1667 Aldehyde Sample Preparation and Analysis by High Performance Liquid

Chromatography (HPLC)

KOTO4PCB Method for the Determination of Polychlorinated Biphenyls in Ambient Air by

EPA TO4

KOWipe Surface Wipe Extraction for PCB Analysis

Volatile Organics

KO524CAL Calibration of Hewlett-Packard Gas Chromatograph/Mass Spectrometer with

Purge and Trap

KO524MS Determination of Volatile Organics by GC/MS by 524.2 using HP GC-MS

KO5035H Closed - System Purge & Trap and Extraction for High-Level Volatile

Organics

KO8260HP The Determination of Volatile Organics by 8260B using Hewlett Packard

GC/MS

KO8260SIM Determination of Volatile Organic Compounds by Selective Ion Monitoring

GC/MS

KO9060B Analysis of Non-Purgeable Organic Carbon (NPOC)

KOTO-14 Determination of Toxic Organic Compounds in Ambient using Specially

Prepared Canisters with Subsequent analysis by Finnigan ITD GC/MS

KOTO-14F Sampling Toxic Organic Compounds in Ambient Air using Specially

Prepared Canisters

KOTPH-GROHP Determination of Gasoline Range Organics by GC/MS by 8260B using H-P

5972B GC-MS

<u>Waste</u>

KW005 The ASTM Water-Shake Extraction of a Solid Waste

KW010 The Determination of Heat of Combustion Using Bomb Calorimetry

KW015	The Boiling Point Determination
KW025	The Evaluation of a Solid Waste for the Characteristic of Ignitability
KW030	The Determination of Flash Point using the Pensky-Martens Closed Cup Apparatus
KW035	The Evaluation of a Sample for Corrosivity
KW040	The Determination of Specific Gravity and/or Density
KW045	The Classification and Assignment of a Packing Group to a Readily Combustible Solid of Division 4.1 Using the Burning Rate Test
KW050	The Quantitation of Total Halogens Via Bomb Combustion
KW055	The Classification and Assignment of a Packing Group to a Dangerous When Wet Material of Division 4 3
KW060	The Evaluation of Solid Waste for the Characteristic of Reactivity (Includes Procedure for Interaction with Water)
KW065	Leaching Procedures: TCLP, SPLP, and Method 8315
KW070	The Determination of Total Sulfur
KW080	The Determination of Viscosity Using the Brookfield Viscometer
KW090	Determination of Water Content Using a Karl Fischer Titrimeter
KW095	The Determination of Volatile Contents
KW100	The Characterization of Materials of Unknown Composition
KW200	The Management of Laboratory Waste: Organic Solvents
KW210	The Management of Laboratory Waste ⁻ PCB-Contaminated Materials
KW220	The Management of Laboratory Waste Client Samples

Water Quality

KQ010	The Calibration of Temperature Measuring Devices Against an NIST - Traceable Thermometer
KQ020	Performing a Method Detection Limit (MDL) Study
KQ027	Policies and Practices for Proper Dilution
KQ037	The Operation and Care of the Precision DD-20 Vacuum Pump
KQ040	Recordkeeping Associated with the Preparation of Reagents for Water Quality Analysis
KQ062	Use, Care, and Calibration of Mechanical Pipettors in the Water Quality and Trace Metals Laboratories
KQ070	The Cleaning of General Laboratory Glassware and Equipment

KQ085	Determination of Sulfuric and Phosphoric Acid Concentrations in an Electropolishing Bath Sample
KQ090	Determining the Resistivity of a Brine Sample
KQ095	Determination of Ferrous Ion In Water
KQ110	The Aqueous Prep of a Solid Sample for a Water Quality Analysis
KQ112	Specification Testing for a Quicklime Sample
KQ115	The Quantitation of Acidity in Water by Titration
KQ117	Total Organic Carbon in Soil by the Walkley-Black Method
KQ120	Quantitation of Alkalinity in Water by Titration
KQ130	The Determination of Biochemical Oxygen Demand (BOD), Carbonaceous Biochemical Oxygen Demand (CBOD), and Ultimate BOD (UBOD), and Ultimate CBOD (UCBOD)
KQ132	Client Notification of a Drinking Water MCL Excedence
KQ195	The Quantitation of Residual Chlorine by the DPD Method
KQ200	The Quantitation of Total Residual Chlorine by Iodometric Electrode
KQ205	The Quantitation of Chlorine Demand
KQ210	The Quantitation of Chemical Oxygen Demand (COD) by the Spectrophotometric Method
KQ222	The Quantitation of Sulfite in Water by Iodometric Titration
KQ230	Monitoring and Maintenance of the Laboratory Water Deionization System
KQ250	The Colorimetric Determination of All Forms of Cyanide
KQ255	The Quantitation of Available Cyanide in Water Using the OIA FS3100 Flow Injection System
KQ300	The Quantitation of Formaldehyde in Water using the Acetylacetone Method
KQ305	The Semi-quantitative Determination of Heavy Metal Impurities in an Aqueous Sample by Visual Comparison
KQ310	The Determination of Hardness by Calculation
KQ311	The Determination of Total Hardness in Water by EDTA Titration
KQ330	The Determination of Water's Saturation (Langelier) Index
KQ340	The Analysis of Methylene Blue-Active Substances (MBAS) in Water
KQ355	The Quantitation of Ammonia-Nitrogen in Water by Flow Injection Analysis
KQ356	The Quantitation of Ammonia-Nitrogen in Water by Discrete Analysis
KQ365	The Quantitation of Nitrate-Nitrogen and/or Nitrite-Nitrogen in Water using the Lachat QuikChem AE(FIA)
KQ375	The Quantitation of Oil and Grease (as Syltherm)

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KQ380	The Quantitation of Chloride in Water by Flow Injection Analysis
KQ381	The Quantitation of Chloride in Water by Discrete Analysis
KQ392	The Determination of Total Kjeldahl Nitrogen (TKN) and Organic Nitrogen by Thermal Digestion and Flow Injection Analysis(FIA)
KQ395	The Quantitation of Total Nitrogen in an Aqueous Sample
KQ396	The Quantitation of Organic Nitrogen in an Aqueous Sample
KQ397	The Quantitation of Total Inorganic Nitrogen in an Aqueous Sample
KQ405	Determination of Threshold Odor in Water
KQ410	The Quantitation of Dissolved Oxygen in Water by Membrane Electrode
KQ425	The Determination of Soil pH and/or Waste pH by the Electrometric Method
KQ430	The Determination of Total Phenolics in Water by Distillation and Flow Injection Quantitation
KQ440	The Colorimetric Determination of Hexavalent Chromium in Water
KQ441	Alkaline Digestion for Hexavalent Chromium in Soil and Solids by EPA 3060A
KQ450	The Colorimetric Determination of Various Forms of Phosphorus
KQ455	The Determination of Phosphorus Adsorption Capacity and Bray P1 Concentration of a Soil
KQ461	The Analysis of Silica and/or Silicate by the Heteropoly Blue Method
KQ462	The Gravimetric Determination of Moisture and Total Solids at 103-105℃
KQ463	The Determination of Dry Weight Solids at 103-105℃
KQ464	The Gravimetric Determination of Fixed and/or Volatile Solids at 550 ℃
KQ466	The Gravimetric Determination of Total, Fixed and/or Volatile Dissolved Solids at 180 ℃
KQ468	The Gravimetric Determination of Total, Fixed, and Volatile Suspended Solids
KQ470	Quantitation of Sulfate in Water by the Manual Turbidimetric Method
KQ480	The Determination of Loss of Oil on a Sample of Metal Chips
KQ500	The Quantitation of Volatile Organic Acids in Water by Distillation and Titration
KQ536	The Quantitation of Total and Reactive Sulfide by Flow Injection Analysis
KQ575	The Determination of Water-Soluble Substances
KQ585	The Quantitation of Tannın and Lıgnın ın Water
KQ595	Operation of the OI Analytical FS3100 for Ion Analysis by Flow Injection

KQ600E	Determination of Fluoride, Chloride, Nitrite, Nitrate, Bromide, Phosphate and/or Sulfate in Water by Ion Chromatography
KQ610	Operation and Maintenance of the SmartChem® Discrete Analyzer
KQ620	The Operation and Calibration of the Perkin Elmer 1605 FT-IR

KAR Bioanalytical SOP Index

SOP No.	Title
CAL004	Calibration and Maintenance of Fluorescence Detectors used for Pharmaceutical Analysis
CAL005	Calibration and Maintenance of Pharmaceutical Laboratory Instrumentation and Equipment
CAL006	Calibration and Maintenance of UV/Vis Detectors used for Pharmaceutical Analysis
CAL007	Calibration and Maintenance of HPLC Pumps used for Pharmaceutical Analysis
CAL008	Calibration and Maintenance of HPLC Autosampler and Associated Temperature Controller used for Pharmaceutical Analysis
CAL011	Calibration, Maintenance, and Use of Pipettes
CAL016	Calibration of Gas Chromatographs with Electron Capture Detection
CAL018	Calibration and Use of Analytical and Top-Loading Balances
CAL021	Use and Calibration of pH Meters
CAL022	Calibration of Thermometers and Thermocouples
CAL039	Calibration and Maintenance of Refractive Index Detectors used for Pharmaceutical Analysis
CAL046	Calibration of the Varian SpectrAA-20 Plus Atomic Absorption Spectrometer for Pharmaceutical Analysis
CAL048	Calibration of the EMAX Microplate Reader used for Pharmaceutical Analysis
CAL901	Calibration, Maintenance, and Use of the THDx Chart Recorder for Temperaqture and Humidity Monitoring
CAL902	Calibration of Gas Chromatographs with Flame Ionization Detection
CAL911	Calibration and Maintenance of HPLC Column Temperature Controller used for Pharmaceutical Analysis
GP001	Formulation Testing Guidelines and Acceptance Criteria
GP002	Validation of Bioanalytical Assays
GP003	Run Criteria: Bioanalytical Acceptance Criteria and Guidelines
GP004	Validation of Formulation Assays
GP009	Creating and Maintaining Standard Operating Procedures (SOPs) for the Pharmaceutical Department
GP012	Glossary of Terms

GP015	Installation, Operation, and Performance Qualification (IQ/OQ/PQ)
GP017	Investigation and Reporting of Out of Specification Results for Dose Formulation Testing
GP019	Handling of Pharmaceutical Samples
GP020	Change Control
GP024	Pharmaceutical SOP Deviation Request/Notification Procedure
GP025	Recording, Editing, Reviewing and Retention of Raw Data
GP027	Rounding and Reporting of Numerical Results
GP028	GLP Documentation
GP031	Laboratory Investigation
GP032	Facilities and Utilities: Use and Maintenance
GP033	Client Audits in the Pharmaceutical Laboratory
GP034	Data Packet or Laboratory Notebook Documentation and Review
GP037	GMP Training in the Pharmaceutical Laboratory
GP044	Software Validation
GP045	FDA Inspections
GP047	Assignment, Review, Retirement, and Archiving of Laboratory Notebooks and Logbooks
GP900	Responding to Power Outages, Disasters, and Security Violations
GP903	Handling of Controlled Substances
GP904	Operation of Mınıtab Statıstıcal Software
GP905	Creating, Reviewing, and Issuing Final Data Reports
GP906	Activating Protocols/Study Plans
GP914	Calculations for the Analysis of Pharmaceutical Data
GP918	Electronic Scanning of Data Packets
GP920	Responsibility of the Principal Investigator in the Pharmaceutical Laboratory
GP921	Control Measures for Bloodborne Infectious Diseases
GP925	Pharmaceutical Analytical Method Deviation Request Procedure
GP926	Handling of Analytical Standards inthe Pharmaceutical Laboratory
GP927	Handling of Matrix/Vehicle Blanks in the Pharmaceutical Laboratory
KP049	Calibration Check of the Micromass Quattro Mass Spectrometer
KP923	Calibration Check of the Sciex Mass Spectrometer
KP924	Operation of Waters Alliance Separations Module and Sciex Mass Spectrometer Using Analyst Software
LAB009	Creating and Maintaining Pharmaceutical Analytical Methods
LAB010	Preparation, Storage and Disposal of Quality Control Standards for Bioanalytical Studies

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LAB014	Labeling, Storage, and Documentation of Prepared and Purchased Chemicals and Reagents in the Pharmaceutical Laboratory
LAB023	Naming Conventions Used for Pharmaceutical Analysis
LAB030	Tracking and Numbering of Data Packets
LAB035	Freezer and Refrigerator Temperature Monitoring and Maintenance
LAB041	Biological Sample Repeat Analysis and Acceptance Criteria
LAB907	Maintenance of Laboratory Centrifuges
LAB909	Using Millennium ³² to set-up Waters Alliance Separations Module and Waters Dual Wavelength Detector for Analysis
LAB910	Operation of Waters Alliance Separations Module and Micromass Quattro LC Mass Spectrometer Using MassLynx NT
LAB912	Operation of E-MAX Plate Reader using SOFTmax® Pro
LAB913	Use of the Cahn Microbalance
LAB917	Operation of Watson® Laboratory Information Management System
LAB919	Determination of Statistical Outliers
QA029	Internal Audits of the Pharmaceutical Laboratory
QA036	Responsibility of Quality Assurance in the Pharmaceutical Laboratory
QA038	Pharmaceutical Drug Master Schedule
QA050	In-Study Inspection Program



Burlington

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STATEMENT OF QUALIFICATIONS

August 2009



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SECTION 1

COMPANY OVERVIEW

1.1 TESTAMERICA LABORATORIES HISTORY AND OVERVIEW

TestAmerica is the leading environmental testing firm in the United States, including 42 laboratories, 24 service centers and additional locations in Asia. TestAmerica provides a vast array of analytical testing services, including analyses for source and ambient air, specialty organics and dioxin, drinking water, emerging contaminants, sediments, radiochemistry and mixed wastes, tissue preparation and analysis. TestAmerica affiliate companies include TestAmerica Air Emissions Corp. (METCO Environmental), specializing in air emissions testing; TestAmerica Drilling Corp., provider of innovative environmental and geotechnical drilling; EMLab P&K, the leader in indoor air quality, and QED Environmental Systems, Inc., the leading supplier of groundwater sampling equipment and remediation pumping systems. TestAmerica employs over 3,200 personnel dedicated to exceptional service and solutions for our clients' environmental testing needs.

TestAmerica Burlington – Customer Assistance

Bill Cicero, Laboratory Director	South Burlington, Vermont
Steve Timmons, Customer Service Manager	Facsimile. 802-660-1919
Jim Madison, Project Manager	
Don Dawicki, Project Manager	
R.J. Lavigne, Project Manager	
Kristine Dusablon, Project Manager	
Kirstin McCracken, QA Manager	



TestAmerica Laboratory U.S. Locations

Location Reference	Street 1	Street 2	City	State	Zip	Tel	Fax, E-fax
	2000 W International						
TestAmerica Anchorage	Airport Road	Suite A10	Anchorage	AK	99502	907 563 9200	907 563 9210
TestAmerica Austin	14050 Summit Drive	Suite A-100	Austin	TX	78728	512 244 0855	512 244 0160
TestAmerica Buffalo	10 Hazelwood Drive		Amherst	NY	14228	716 691 2600	716 691 7991
TestAmerica Cedar Falls	704 Enterprise Drive		Cedar Falls	IA	50613	319 277 2401	319 277 2425
TestAmerica Chicago	2417 Bond Street		University Park	IL	60466	708 534 5200	708 534 5211
TestAmerica Connecticut	128 Long Hill Cross Road		Shelton	CT	06484	203 929 8140	203 929 8142
TestAmerica Corpus Christi	1733 North Padre Island Drive		Corpus Christi	TX	78408	361 289 2673	361 289 2471
TestAmerica Dayton	4738 Gateway Cırcle		Dayton	ОН	45440	937 294 6856	937 499 1249
TestAmerica Denver	4955 Yarrow Street		Arvada	CO	80002	303 736 0100	303 431 7171
TestAmerica Edison	777 New Durham Road		Edison	NJ	08817	532 549 3900	732 549 3679
TestAmerica Honolulu	99-193 Alea Heights Drive	Suite 121	Aiea	HI	96701	808 486 5227	808 486 2456
TestAmerica Houston	6310 Rothway Street		Houston	TX	77040- 5862	713 690 4444	713 690 5646
TestAmerica Irvine	17461 Derian Ave	Suite 100	Irvine	CA	92614	949 261 1022	949 260 3299
TestAmerica King of Prussia	1008 W Ninth Ave		King of Prussia	PA	19406	610 337 9992	610 337 9939
TestAmerica Knoxville	5815 Middlebrook Pike		Knoxville	TN	37921	865 291 3000	865 584 4315
TestAmerica Los Angeles	3585 Cadıllac Ave	Suite A	Costa Meca	CA	92626	714 258 8610	714 258 0921
TestAmerica Mobile	900 Lakeside Drive		Mobile	AL	36693	251 666 6633	251 666 6696
TestAmerica Nashville	2960 Foster Creighton Drive		Nashville	TN	37204	800 765 0980	615 726 3404
TestAmerica North Canton	4101 Shuffel Street, N W		North Canton	ОН	44720	330 966 9396	330 497 0772
TestAmerica Ontario	1014 East Cooley Drive	Suite A	Colton	CA	92324	909 370 4667	909 370 1046
TestAmerica Pensacola	3355 McLemore Drive		Pensacola	FL	32514	850 474 1001	850 474 4789
TestAmerica Phoenix	4625 E Cotton Center Blvd	Suite 189	Phoenix	AZ	85044	602 437 3340	602 454 9303



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Location Reference	Street 1	Street 2	City	State	Zip 🎺	Tel	Fax, E-fax
TestAmerica Pittsburgh	301 Alpha Drive		Pittsburgh	PA	15238	412 963 7058	412 963 2468
TestAmerica Portland	9405 SW Nimbus Avenue		Beaverton	OR	97008	503 906 9200	503 906 9210
TestAmerica Richland	2800 George Washington Way		Richland	WA	99354	509 375 3131	509 375 5590
TestAmerica San Francisco	1220 Quarry Lane		Pleasanton	CA	94566	925 484 1919	925 600 3002
TestAmerica Savannah	5102 LaRoche Avenue		Savannah	GA	31404	912 354.7858	912 352 0165
TestAmerica Seattle/Tacoma	5755 8th Street East		Tacoma	WA	98424	253 922 2310	253 922 5047
TestAmerica Spokane	11922 E 1st Ave		Spokane	WA	99206	509 924 9200	509 924 9290
TestAmerica St. Louis	13715 Rider Trail North		Earth City	МО	63045	314 298 8566	314 298 8757
TestAmerica Tallahassee	2846 Industrial Plaza Drive		lahassee	FL	32301	850 878 3994	850 878 9504
TestAmerica Tampa	6712 Benjamin Road	Suite 100	Tampa	FL	33634	813 885 7427	813 885 7049
TestAmerica Valparaiso	2400 Cumberland Drive		Valparaiso	IN	46383	219 464 2389	291 462 2953
TestAmerica Watertown	602 Commerce Drive		Watertown	WI	53094	920 261 1660	920 261 8120
TestAmerica West Sacramento	880 Riverside Parkway		West Sacramento	CA	95605	916 373 5600	916 372.1059
TestAmerica Westfield	53 Southampton Road		Westfield	MA	01085	413 572 4000	413 572 3707



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1.2 BURLINGTON LABORATORY

The technical core of TestAmerica Burlington is a full service chemical analysis laboratory which was established in 1970. This laboratory has earned the respect of clients for more than 38 years. Laboratory personnel successfully completed numerous analytical projects for the government and private sectors. Special analysis capabilities have grown out of a desire to meet the needs of our clients.

Currently, as a laboratory with over 39 years of experience, the Burlington laboratory has self disclosed to the United States Army Corps of Engineers (USACE), maintains accreditation in several states for analytical services under the National Environmental Laboratory Accreditation Program (NELAP). The laboratory's primary NELAP accreditation is maintained through the New Jersey DEP. TestAmerica Burlington is also approved by the Naval Facilities Engineering Service Center (NFESC) as a subcontractor to provide analytical services in support of Navy and Marine projects. The laboratory is compliant with the current version of the Department of Defense Quality Systems Manual and supports perchlorate analyses following the current version of the DoD Perchlorate Handbook.

TestAmerica Burlington has a philosophy of working in partnership with our clients. This team relationship allows us the opportunity to apply our skills and understanding of regulating and monitoring requirements from an analytical laboratory perspective, thereby optimizing the analytical work for a given project. This tailoring of the analytical work to the specific needs of the project efficiently generates defensible data.

It is our objective to be acknowledged as an organization that provides services and deliverables with the qualities of responsiveness, trustworthiness, resourcefulness, timeliness, economy, accuracy and professionalism. The laboratory is NELAP certified by the state of New Jersey Department of Environmental Protection, holds certifications in many states and has been approved for work under the:

- U.S. Army Corps of Engineers (USACE)
- Naval Facilities Engineering Service Center (NFESC)
- The laboratory also maintains a soil permit for the receipt and analysis of foreign & domestic soils under the USDA.

Laboratory Facilities

The 40,000 square foot facility was designed and built as an environmental testing laboratory in 2007. The office and laboratory spaces are arranged to facilitate smooth and efficient flow of samples, data, and project information through the entire analytical process. All entrances have controlled access security systems.



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1.3 CAPABILITIES

TestAmerica Burlington is a full-service environmental analytical laboratory providing services to consulting firms, government, and industry. Common matrices encountered are air, groundwater, surface water, soil, sediments, tissues, vegetation, hazardous and non-hazardous wastes, and sludge. **Specialty laboratory services include:**

Department of Defense - TestAmerica Burlington has more than 16 years of experience analyzing thousands of samples for volatile, semivolatile, air toxics, pesticides, explosives, and metals in support of the environmental efforts of the U.S. Army, Air Force, Navy, Marines, Coast Guard, National Guard, and Army Reserve. The lab has performed analyses on samples from numerous DoD sites in the contiguous United States and Pacific Rim. The Burlington lab has worked with the USACE Cold Regions Research and Engineering Laboratory (CRREL) to develop an expanded 8330 list of explosives (23) and more recently support for Method 8330B following the method as developed by CRREL. Burlington also has added the RDX degredants (MNX, DNX and TNX) to our Method 8330 offering

Ambient Air Testing – The Burlington laboratory has an inventory of more than 1500 canisters and 600 flow controllers for the sampling and analysis of volatiles in air by TO-15. Sampling media and analytical methods are also available for PCBs, PAHs, metals and particulates. The lab also offers the Massachusetts Air-Phase Hydrocarbon (MA APH) method and a hybrid TO-15/APH method.

Sediments and Tissues - Many of Burlington's laboratory personnel have more than 16 years of experience working with tissues, sediments and other biological matrices. The lab offers the analysis of volatiles, Alkyltins (mono – Tetrabutyltin) PCB Homologues, low level PAHs, low level pesticides, metals and lipids.

Geotechnical Testing - TestAmerica Burlington maintains a soils characterization laboratory. Technical personnel follow ASTM procedures to define soil and sediment characteristics such as soil permeability, particle size, Atterberg limits, moisture, density, soil classification, specific gravity, porosity and hydraulic conductivity.

Custom Analytical Services - In addition to routine analyses, TestAmerica Burlington has the capability to provide custom testing services for special projects requiring more sophisticated analyses. All method development goes through rigorous method validation to ensure accurate and complete data. See the Project Reference Section of this document for some examples.



1.4 CAPACITY

TestAmerica Burlington constantly monitors commitments made by our laboratory using a forecasting database. We can reserve capacity by shifting other work to other TestAmerica laboratories (as appropriate and approved) or by shifting the work focus of cross-trained staff. The following table provides estimated monthly capacity for a variety of analyses performed at TestAmerica Burlington.

Routine Capacity

Functional Area	Tests	Weekly Capacity	Monthly Capacity
Metals	ICP (6010B/200 7/CLP)	500	2000
	ICPMS (6020B/200 8/CLP)	250	1000
	CVAA-Mercury (245 1/7470/7471/CLP)	500	2000
Wet Chemistry	Acıd Volatıle Sulfide	100	500
	Ammonia, TKN	200	800
	BOD, COD	250	1000
	Corrosivity, TDS, TSS, TS, VTS	500	2000
	Cyanide	250	1000
	Ion Chromatography (314.0)	500	2000
	Sulfide	150	600
	TOC, Liquid	300	1200
	TOC, Soil	250	1000
Gas Chromatography	TPH-DRO (8015M - Extractable Hydrocarbons)	200	800
	Pesticides/PCBs (8081A/8082/608/CLP)	200	800
	Herbicides (8151A)	200	800
	EDB/DBCP (504.1)	150	600
Mass Spectroscopy	VOCs (8260B/524/CLP)	175	700
	SVOCs (8270C/625/CLP)	500	2000
Liquid Chromatography	Explosives (8330A or 8330B)	200	800
Liquid Chromatography Dual Mass Spec (LC/MS/MS)	Perchlorate (6850 or 331 0)	400	1200



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Functional Area	Tests	Weekly Capacity	Monthly Capacity
Geotechnical	Moisture Content (D2216)	300	1200
	Atterberg Limits (D4318)	50	200
	Organic Content (D2974)	300	1200
	Soil Classification (D2487)	75	300
	In-Place Density (D2937)	150	60
	Organic Soils (D2974)	125	500
	Particle Sıze, Sieve Only (D422)	250	1000
	Particle Size (D422)	150	600
	Plasticity Index (D4318)	75	300
	Specific Gravity (D854)	200	80
	Particulate Matter (PM10)	100	400
Air	NMOC (25C)	100	400
	Fixed Gases (3C or D1946)	100	400
	VOA (TO14A)	250	1000
	VOA (TO15)	250	1000

SECTION 2

SERVICE

2.1 PROJECT MANAGEMENT

Project management is the single most important ingredient to the success of an environmental project. At the laboratory level, our management approach centers around the Project Manager. The Project Manager's role in the project is to act as the interface between the customer and the laboratory to ensure the customer's requirements are met. As such, the Project Manager is a member of your project team whose responsibility is to see that the project's analytical goals are accomplished by the laboratory.

Our Project Managers are involved from project start to finish: From the time of initial client contact; in dialogue with the client during the entire project; and available to answer questions or provide additional information after project completion.



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The Project Manager is the principal client contact and has open access to all technical and management positions to obtain technical expertise and/or resolve resource management and scheduling issues on behalf of the client. The Project Manager will:

- Respond to the client in a timely manner to all requests.
- Provide pricing and technical information.
- Interface with project personnel to plan and schedule sample shipments to the laboratory.
- Organize, schedule and attend project meetings with the client as necessary or helpful.
- Serve as consultant for field efforts to optimize batch sizes, arrange sample shipment/receipt, provide bottles and associated materials.
- Document the client's technical requirements to the laboratory staff.
- Monitor conformance of analytical protocols, quality assurance, and data reporting with contract and technical requirements
- Monitor cost and schedule requirements.
- Secure additional laboratory capacity from other TestAmerica facilities as necessary.

When samples are received at TestAmerica, strict chain of custody procedures are followed and documented. Any inconsistencies are immediately brought to the attention of the TestAmerica Project Manager for resolution with the client.

TestAmerica Project Managers and laboratory department managers have a commitment to maintain project schedules with a goal of 100% on-time delivery of quality data packages. If at any time, a delay in the required project turnaround time is anticipated, the Project Manager will immediately contact the client and inform the customer of the nature of the problem, the corrective action taken, and provide a revised delivery date for the analytical data report.

Normal office hours are 8:00 am to 5:00 pm, Monday through Friday. Our sample receiving department's normal business hours are Monday through Friday from 8:00 a.m. to 5:00 p.m. and Saturday from 8:00 a.m. to Noon. Arrangements can be made for samples to be received outside of normal business hours by notifying your project manager in advance. Should a project require after-hours contact, telephone numbers for the appropriate TestAmerica personnel can be provided.

2.2 DATA MANAGEMENT

TestAmerica has a dedicated data package production/assembly staff. The department personnel review each data package for completeness and consistency before presenting it to the Section Manager, Project Manager and General Manager for final approval. The managers meet regularly to assess project status and reporting requirements. The types of Data Deliverables available at TestAmerica Burlington:



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<u>Standard Commercial Report</u> provides a cover letter, standard glossary, chain of custody, laboratory chronicle, and a sample data report. In addition, Inorganic reports and Organic reports both contain a Quality Control Summary Report. GC/MS Tentatively Identified Compounds (TIC) searches are not performed unless specified by the client. Case narratives are provided only if technical problems occurred and no raw data is provided

<u>CLP/CLP-Like Reports</u> provides a cover letter, standard glossary, chain of custody, laboratory chronicle, and a sample data report. Case narratives and raw data are provided for all CLP reports. Quality Control samples (matrix spikes and duplicates) are run on the client's samples. Organic and metals/cyanide reports provide all CLP Forms as described in the USEPA ILM05.4 and SOM01.2.

<u>Custom Reports</u> are provided for many of our clients. Specific project requirements are agreed upon between the client and the Project Manager, who then informs the laboratory staff of the project QA/QC, turn-around time and deliverable requirements.

<u>Electronic Data Deliverables</u> (EDDs) are provided to numerous government and commercial clients. EDDs can be provided in TestAmerica's standard format, or can be customized to meet client requirements. EDDs can be transferred on diskette, CD, via e-mail or across the web through our MyTAL system. We currently provide EDDs in dozens of different formats that include Lotus and Excel spreadsheets as well as various ASCII and DBF file formats.

While we offer a standard format, most of the formats are customized to meet our clients individual requirements, some of which are very complex. TAL's Information Services and Report Generation departments function to ensure that electronic data provided to the client is accurate and formatted to meet the clients' requirements. Our technical personnel are always available for consultation on producing the specific EDD for your program.

<u>Paperless Report Formats</u> TestAmerica Burlington provides final reports and raw data packages in Adobe Portable Document Format (pdf) via E-Mail or CD-ROM rather than paper as our "standard product." There are significant benefits associated with providing data in PDF.

Cost savings – Paper is expensive to ship and store. Once the final report is converted into an electronic file, it is in a format that is cheaper to manage than its paper counterpart.

Improved report integrity – The entire contents of your PDF final report is indexed and paginated. You will never have to worry about getting pages out of order when working on the package. Pagination of the entire package allows exact reference to any page. Making additional copies of the package is as easy and quick as copying a file.



2.3 QUALITY ASSURANCE PROJECT PLAN ASSISTANCE

TestAmerica Burlington offers assistance to clients in preparing project specific Quality Assurance Plans. Our staff has written and/or assisted in writing numerous Project Specific Quality Assurance Plans for work the laboratory has performed under U.S. EPA oversight. We are knowledgeable regarding the fundamental requirements and have experience with the EPA approval process.

SECTION 3

DEDICATION

3.1 KEY PERSONNEL

TestAmerica Burlington has over 80 professionals specializing in analytical operations, customer service, project management, and data delivery. Highly skilled, experienced people are essential to our customers who are dealing with complex, environmental problems, and we have some of the best in the business. Our staff is extremely knowledgeable in today's analytical technologies and regulatory programs. TestAmerica Burlington is proud of its highly qualified and professional staff. Their development is valued as a key to our success.

Summaries of the key staff's qualifications are provided in the table below. TestAmerica Burlington's key personnel average over 20 years of environmental laboratory experience. Resumes of key personnel are available upon request.

TestAmerica Burlington Laboratory Key Personnel

Name	Position	Degree/Discipline	Experience Start
William S Cicero	Laboratory Director	BS Biology	1997
Kırstın L McCracken	Quality Assurance Manager	BA Geography	1995
Bryce E Stearns	Technical Director	BS Environmental Sciences	1988
Steve C Timmons	Customer Service Manager	BS Business Administration	1979
Kirk F Young	Project Technical Director	BS Civil Engineering, PE	1981
Jon Zygmuntowicz	SVOA GC, GC/MS & HPLC Manager	BS Ecology	1991
Jessica A Holzschuh	Inorganics & Geotechnical Manager	BA Environmental Sciences	1997
Mark T Phillips	VOA & Air Toxics GC, GC/MS Manager	BA Environmental Studies	1991
Chris G Callahan	Extractions Manager	BA Environmental Sciences	2001



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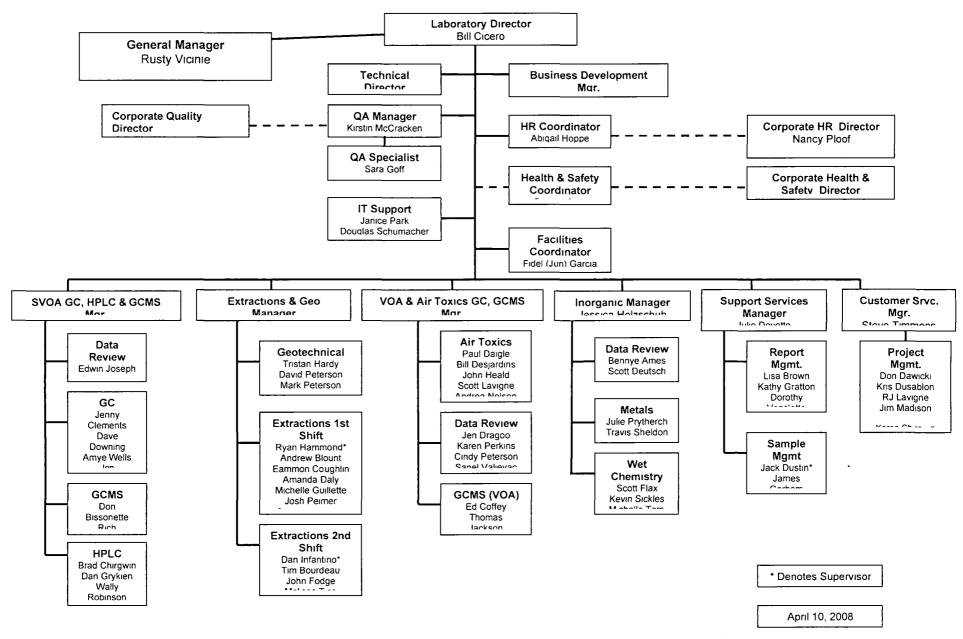
Dan W Helfrich	Environmental Health & Safety Coordinator	MS/MBA Chemistry/Finance	1989
Jack L Dustin	Sample Management Supervisor	Work Experience	2000
Kris A Dusablon	Project Manager	BS Biochemistry/Biophysics	1987
Don C Dawicki	Project Manager	Work Experience	1994
Jim W Madison	Project Manager	BS Environmental Studies	1988
R J Lavigne	Project Manager	BS Business Administration	2004

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Burlington Laboratory Organizational Chart



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3.2 HEALTH AND SAFETY

TestAmerica Management is committed to providing a work environment that is free of recognized environmental safety and health hazards. It is TestAmerica policy, and fundamental to our management principles that all work will be conducted in a manner that is safe to the employee, the community, and the environment. By empowering each TestAmerica employee with the right, the responsibility, and the resources to make safe decisions, we ensure the success of our health and safety programs.

TestAmerica recognizes that health and safety is a team effort. Safety originates at the highest level of management. However, every employee, regardless of position is expected to assume responsibility for their actions and the actions of others around them. Adherence to Environmental Health and Safety procedures is mandatory for every TestAmerica employee and is considered an integral part of each employee's performance.

The Corporate Safety Manual is the primary component of the Hazard Communication / Waste Management Plan for TestAmerica. For regulatory purposes, this document serves as the Chemical Hygiene Plan for laboratory activities and the Hazard communication Program for non-laboratory activities. This document incorporates responsibilities, procedures, protective equipment as well as facility requirements for our operations.

3.3 DISASTER RECOVERY PLAN SUMMARY

In case of a major natural catastrophe, client approved TestAmerica laboratory facilities would be available to provide project continuity and to meet sample holding time or critical project schedule requirements. In the event of instrument failure, portions of the sample load may be diverted to duplicate instrumentation within the facility. In some instances, an alternate approved technique can be used. At the client's direction or approval, samples can also be shipped to another properly certified and approved TestAmerica location for analysis. Detailed procedures for emergency circumstances and a description of emergency systems are located in the Corporate Safety Manual.



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SECTION 4

QUALITY

4.1 QA/QC OVERVIEW

An integral part of TestAmerica's successful experience with its clients is the corporate and local commitment to provide quality services. This attitude towards Quality Assurance/Quality Control (QA/QC) is maintained through all of the divisions and departments. The Burlington laboratory maintains a quality assurance program that is outlined in the laboratory's Quality Assurance Manual (UP-QA-QAM) and managed by Ms. Terese Preston.

TestAmerica Burlington is approved through New Jersey Department of Environmental Protection for the National Environmental Laboratory Accreditation Program (NELAP). TestAmerica's Corporate QA staff work to ensure consistency and uniformity of compliance to the NELAC standard for all our laboratories.

The Quality Assurance Department at TestAmerica Burlington is comprised of professionals experienced in analytical laboratory techniques and quality assurance objectives. This department initiates and oversees audits, corrective action procedures, performs data review, maintains documentation of internal laboratory training, review Quality Assurance Plans for consistency with laboratory operations, tracks and monitors performance evaluation samples, document control, and Method Detection Limits (MDLs). In addition, the preparation of operating practices and quality assurance documentation for the laboratory is coordinated through the QA personnel.

4.2 STANDARD OPERATING PRACTICES

TestAmerica Burlington maintains extensive documentation of Standard Operating Procedures (SOPs). We understand the need for SOP compliance and perform internal audits to assure that the laboratory staff adheres to the written SOPs, complies with accreditation/certification requirements and meets project objectives. The audit types and frequency are outlined in the Quality Assurance Manual and are scheduled by the QA/QC department.

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4.3 CLIENT CONFIDENTIALITY & PROPORIETARY RIGHTS

Data and sample materials provided by the client or at the client's request, and the results obtained by TestAmerica Burlington, are held in confidence subject to any disclosure required by law or legal process. TestAmerica Burlington's reports and the data and information provided therein, are for the exclusive use and benefit of the client, and are not released to a third party without written consent from the client.

4.4 RECORD RETENTION & ARCHIVAL

TestAmerica Burlington has developed a formal record retention policy that is outlined in the Laboratory's Quality Assurance Manual and in the corporate Record Retention Policy. These documents outline the period of time various record types must be archived. Archives are indexed such that records are accessible on either a project or temporal basis. Archives are protected against fire, theft, loss, deterioration and vermin. Electronic records are protected from deterioration caused by magnetic fields and/or electronic deterioration. Access to archives is controlled and documented.

4.5 LABORATORY QAPP

TestAmerica Burlington's Quality Assurance Manual (QAM) is a document prepared to define the overall policies, organization objectives and functional responsibilities for achieving TestAmerica's data quality goals. Each TestAmerica laboratory maintains a local perspective in its scope of services and client relations and maintains a national perspective in terms of quality.

The QAM has been prepared to assure compliance with the 2003 National Environmental Laboratory Accreditation Conference (NELAC) standards and ISO/IEC Guide 17025 (1999) In addition, the policies and procedures outlined in this manual are compliant with the various accreditation and certification programs listed in the laboratory certification/accreditations table below. The relevant NELAC section is included in the heading of each QAM section.

The QAM has been prepared to be consistent with the requirements of the following documents:

- EPA 600/4-88/039, Methods for the Determination of Organic Compounds in Drinking Water, EPA, Revised July 1991.
- EPA 600/R-95/131, Methods for the Determination of Organic Compounds in Drinking Water, Supplement III, EPA, August 1995.



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- EPA 600/4-79-019, Handbook for Analytical Quality Control in Water and Wastewater Laboratories, EPA, March 1979.
- EPA SW-846, *Test Methods for the Evaluation of Solid Waste, 3rd Edition,* September 1986; Update I, July 1992; Update II, September 1994; and Update III, December 1996.
- Federal Register, 40 CFR Parts 136, 141, 172, 173, 178, 179 and 261.
- USEPA Contract Laboratory Program. Statement of Work for Inorganics Analysis. Multi-Media, Multi-Concentration. Document ILM04.0.
- USEPA Contract Laboratory Program. Statement of Work for Organics Analysis. Multi-Media, Multi-Concentration. Document Number OLMO4.2, May 1999.
- APHA, Standard Methods for the Examination of Water and Wastewater, 18th Edition, 19th, 20th and 21st Edition.
- U.S. Department of Energy, Quality Systems for Analytical Services, Revision 2.2, October 2006.
- U.S. Department of Defense, Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006.
- U.S. Department of Defense, Air Force Center for Environmental Excellence Quality Assurance Project Plan (QAPP), Version 4.0.02, May 2006.
- Shell for Analytical Chemistry Requirements, US Army Corps of Engineers, EM 200-1-3, Appendix I, February 2001.
- National Environmental Laboratory Accreditation Conference, Constitution, Bylaws, and Standards, EPA 600/R-04/003, US EPA Office of Research and Development, June 2003
- Toxic Substances Control Act (TSCA)

4.6 AUDITS AND PERFORMANCE PROGRAMS

TAL Burlington participates in numerous federal, state, and industrial audit and performance sample programs for organic and inorganic analyses, including regular participation in the following performance studies:

- DMR-QA (supplied by client)
- Environmental Resource Associates (ERA) WS/WP/SW (2x yearly)
- U.S. Army Corps of Engineers
- Various Client Specific Programs

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4.7 STATE CERTIFICATIONS AND AGENCY APPROVALS

TestAmerica Burlington's list of current state certifications, registrations and agency approvals is provided below.

Authority	Lab ID	Program	Matrix / Category	Expires
Florida	E87467	NELAC/NELAP	Air	07/29/10
New Hampshire	200607	NELAC/NELAP	Drinking Water	12/18/09
New Hampshire	200607	NELAC/NELAP	Solid Waste	12/18/09
New Hampshire	200607	NELAC/NELAP	Wastewater	12/18/09
New Jersey	VT972	NELAC/NELAP	Air	06/30/10
New Jersey	VT972	NELAC/NELAP	CLP	06/30/10
New Jersey	VT972	NELAC/NELAP	Drinking Water	06/30/10
New Jersey	VT972	NELAC/NELAP	Solid Waste	06/30/10
New Jersey	VT972	NELAC/NELAP	Wastewater	06/30/10
New York	10391	NELAC/NELAP	Air	04/01/10
New York	10391	NELAC/NELAP	Drinking Water	04/01/10
New York	10391	NELAC/NELAP	Solid Waste	04/01/10
New York	10391	NELAC/NELAP	Wastewater	04/01/10
Pennsylvania	68-00489	NELAC/NELAP	Solid Waste	04/30/10
Pennsylvania	68-00489	NELAC/NELAP	Wastewater	04/30/10
NFESC	N/A	NFESC	Air	07/30/09
NFESC	N/A	NFESC	Biological	07/30/09
NFESC	N/A	NFESC	Solid Waste	07/30/09
NFESC	N/A	NFESC	Wastewater	07/30/09
Connecticut	PH-0751	State Program	Drinking Water	04/17/11
Connecticut	PH-0751	State Program	Solid Waste	04/17/11
Connecticut	PH-0751	State Program	Wastewater	04/17/11
Delaware	DNREC	State Program	VVasicvatci	06/30/10
Maine	VT0008	State Program	Drinking Water	04/17/10
Maine	VT0008	State Program	Wastewater	04/17/10
Minnesota	V 1 0 0 0 0	State Program	Air	03/30/11
Rhode Island	LAO00298	State Program	Drinking Water	12/30/09
Rhode Island	LAO00298	State Program	Wastewater	12/30/09
Vermont	VT-4000	State Program	Drinking Water	12/30/09
West Virginia	V 1-4000	<u>-</u>	Air	02/28/10
USACE	N/A	State Program	All	
USACE	IN/A	USACE		12/01/09

The certificates and parameter lists (which may differ) for each organization may be found on the corporate web site or the laboratory's public server.



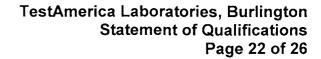
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SECTION 5

EXPERIENCE

5.1 PROJECT EXPERIENCE

TestAmerica Burlington has provided environmental chemical analyses for over 32 years. The management staff has worked together as a team for approximately 21 years, creating an organization with in-depth experience, extensive knowledge of the environmental field, and a high level of internal cooperation. Developing productive, on-going relationships with our clients is the cornerstone of our success. TestAmerica's client base is widely varied; some of the types of clients and projects we serve are listed below.





Client	Project	Project Description	Project Revenue	Period of Performance
AMEC Earth &	MMR	TestAmerica Burlington supported AMEC Earth & Environmental	\$12 5M	1998 to 2006
Environmental	Groundwater	during a Groundwater Quality Study for the Camp Edwards Impact		
239 Littleton Road	Impact Study, Cape Cod, MA	Area on the Massachusetts Military Reservation (MMR). This project was initiated for the National Guard Bureau under an EPA		
Westford, MA 01886		Administrative Order and continues with EPA and US Army Corp of Engineers oversight. Over twenty thousand soil and water samples		
Marilyn Hoyt		have been analyzed for a wide range of parameters including a modified SW-846 method 8330 procedure. Modifications include the		
((978) 692-9090		addition of non-routine compounds to a single extraction and analysis, coupled with provision of Photo Diode Array spectra to aid		
Regulatory Oversight: USACE New England District		in data interpretation. TestAmerica Burlington is currently providing support for Phase III of this project, for which select drilling process sample results are provided on a 24-hour TAT basis. Additionally, to support a request for lower soil reporting limits at the MMR site, TestAmerica Burlington developed a modified 8330 method to quantify trace levels of explosive residue with a ten-fold reduction in base reporting limits.		



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CH2M Hill 5700 Cleveland St. Suite 101 Virginia Beach, VA 23462 Ms Anita Dodson (757) 518-9666 Regulatory Oversight: NFESC	Marine Corps Base Camp Lejeune Knox Park, CTO- 191	The TestAmerica Burlington laboratory provided analytical support for a large sampling event at Knox Park, Camp Lejeune. The client collected hundreds of soil, groundwater, sediment and surface water samples. The samples were analyzed for CLP Volatiles, Semivolatiles, Pesticides, PCBs, Metals, Trace Level Explosives and Perchlorate by LC/MS/MS following the DoD perchlorate Handbook. A fully validatable CLP/CLP-like data package and SNEDD deliverables were provided. The laboratory followed DoD QSM Version 3.0 for the project.	~\$390K	September – December 2007
AMEC Earth & Environmental 5510 Morehouse Dr. San Diego, CA 92121 Mr. Rolf Schottle (858) 458-9111	Orote' Landfill Study - Guam	TestAmerica Burlington is currently performing analyses in support of a quarterly groundwater monitoring program. The samples will be analyzed for a variety of parameters, including NOAA Status and Trends Pesticides, PCB Congeners, Metals and Polynuclear Aromatic Hydrocarbons by Single Ion Monitoring. We also previously support a large seawater and tissue sample investigation, for the Navy's Pacific Division To date, approximately 200 tissue samples have been analyzed for a variety of parameters, including NOAA Status and Trends Pesticides, PCB Congeners, Metals and Polynuclear Aromatic Hydrocarbons by Single Ion Monitoring.	\$250K year to date.	2001 to present
Regulatory Oversight: NFESC				



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CH2M Hill 5700 Cleveland St Suite 101 Virginia Beach, VA 23462 Ms Megan Hilton (757) 518-9666 Regulatory Oversight: NFESC	Naval Weapons Station Yorktown, CTO-258	The TestAmerica Burlington laboratory provided analytical support for a large sampling event at Naval Weapons Station Yorktown The client collected approximately one hundred and fifty soil and groundwater samples. The samples were analyzed for CLP Volatiles, Semivolatiles, Pesticides, PCBs, Metals, Trace Level Explosives. A fully validatable CLP/CLP-like data package and SNEDD deliverables were provided. The laboratory followed DoD QSM Version 3.0 for the project	~\$104K	September – October 2007
Arcadis 8 South River Road Cranbury, NJ 08512 Ms. Kiersten Robbins (609) 860-0590 Regulatory Oversight: USEPA Region 2	Industrial Site Investigation, Puerto Rico	TestAmerica Burlington recently completed a large industrial investigation in Puerto Rico comprising 94 samples, each of which received analysis for nine separate methods, including herbicides, organophosphorus pesticides, routine pesticides and PCBs, GRO/DRO, volatiles and semivolatiles. The semivolatile analyses included the addition of a non-routine target compound. This project was completed on-schedule, on an expedited TAT. Samples were picked-up at the site by the TestAmerica Service Center in Puerto Rico, and final data packages were approved by the TestAmerica Puerto Rico Licensed Chemist.	\$86K	11/19/2003 – 12/26/2003



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MWH, Americas 335 Phoenixville Pike Malvern, PA 19355 Mr. Steve Alberts (610) 407-7940 Regulatory Oversight: AFCEE and Maine Department of Environmental Conservation	Loring Air Force Base, Limestone, ME	TestAmerica Burlington was under contract to provide analytical services for long-term groundwater, surface water, tissue, air and sediment sampling activities at the Loring Air Force Base located in Limestone, Maine. To meet a site-specific action limit TestAmerica developed a SIM method for low-level quantitation of vinyl chloride. These services include the analyses of over 1,500 samples, to date. These samples have been analyzed for volatile organic compounds, semivolatile organic compounds, pesticides, PCBs, PCB congeners, PAHs, dissolved gases and a variety of wet chemistry methods following the Installation – Wide Quality Program Plan. The USEPA, AFCEE and the Maine DEP provide the regulatory oversight on this CERCLA – NPL Site. The CLP-like deliverables and an Enhanced ERPIMS 4.0 diskette are provided within 15 business days of sample receipt.	\$2 25M	4/1/99 to 08/31/05	
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